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Aviation in Southern Ontario

A Strategy for the Future

January 1990

Transport Canada Airports
Transports Canada Aéroports
Canada

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AVIATION IN SOUTHERN ONTARIO
A STRATEGY FOR THE FUTURE

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SECTION 1.0

INTRODUCTION

1.1 PREFACE

This report has been prepared for the Environmental Assessment and Review Panel. This panel has been convened to examine the Minister of Transport's proposals for early provision of additional airside capacity at Lester B. Pearson International Airport (LBPIA), and the longer range proposals that will be contained in the Pearson Master Plan and Southern Ontario Aviation Plan.

This report explains the Minister's proposals for addressing the aviation needs for Southern Ontario into the next century and the immediate problem of providing medium term airside capacity at LBPIA.

1.2 BACKGROUND

1.2.1 Lester B. Pearson International Airport

During the past 50 years, Lester B. Pearson International Airport (subsequently referred to as LBPIA or Pearson) has grown from Toronto's second airport to Canada's largest and most important airport, and one of the 20 busiest airports in the world.

From the inauguration of Malton Airport, with its two hard-surfaced runways and a grass landing strip in 1938, to the present, the site has been through several periods of development.

The first terminal building, the Chapman Farmhouse, was replaced in 1939 by a dedicated building identical to the existing facility at Toronto Island. This building was replaced in 1945 by a one-storey brick structure which was enlarged in 1954 and 1959.

In 1958, a major redevelopment of the airport began, including construction of Terminal 1 which was officially opened in 1964. Construction of Terminal 2 began in 1969 and was completed in 1972. A third terminal is currently being constructed and will be opened in the late summer of 1990.

In terms of air traffic, the first official landing at the airport was on August 29, 1938 by an American Airlines DC-3. Trans Canada Airlines commenced scheduled service at Malton on October 18, 1939. In 1960, BOAC introduced scheduled trans-oceanic service. By 1967, 10 airlines were using the airport: Air Canada, American Airlines, Canadian Pacific (now Canadian Airlines International), BOAC (now British Airways), Eastern Airlines, Mohawk (now U.S. Air), United Airlines, and North Central (renamed Republic Air in 1980). Today there are 41 regularly scheduled carriers serving the airport, as well as 12 charter and seasonal air carriers. (See Annex 3 for a complete list.)

These developments over the past 50 years have resulted in LBPIA becoming a major economic generator not only for the area around the airport, but also for the province and the nation. Pearson, in 1987, generated approximately 56,000 jobs in the Toronto region which resulted in wage payments of $1.8 billion, and business revenues of $3.8 billion. (See Annex 4.)

Pearson is the major international gateway to Canada for both passengers and air cargo. It is also the national "hub" airport through which the free flow of goods and traffic, which are critical to the national economy, takes place.

1.2.2 Historical Expansion Proposals at LBPIA

The future of the Toronto area airport system has been a source of public controversy for over 20 years. The uncertainty that surrounds the development of this airport has its roots in a 1968 government decision to build a second major airport at Pickering rather than site expansion at Pearson. The Pickering project was subsequently halted in 1975 due to a provincial decision not to proceed with roads and utilities required

to service the site. Since that time, efforts have focused on accommodating the majority of the Toronto-centered air traffic at Lester B. Pearson International Airport without the addition of runways.

These decisions were made during a period when air transportation was heavily regulated in Canada and, in fact, during the post-1975 period, several growth restrictions were placed on Pearson by various governments. These actions included a moratorium on new international services and restrictions on certain classes of air traffic. These restrictions limited growth and caused most light aircraft, non-commercial aircraft, and aircraft that were not equipped to fly by instrument flight rules (IFR) to shift their base of operations away from Pearson to other airports in the area.

The 1968 decision to not build runways at LBPIA was re-affirmed several times after 1968. However, the effects of regulatory reform and rapid economic expansion in Southern Ontario now require a reconsideration of this position.

1.2.3 LBPIA's Role in the National Transportation System

Since the purchase of nine farm properties by the City of Toronto in 1938, LBPIA has evolved to become Canada's busiest airport, and one of Canada's major transportation facilities.

In terms of the 3 factors (aircraft movements, passengers and cargo throughput) employed to measure an airport's performance, Pearson is unrivalled in Canada, and is among the 20 largest airports in the world. In order to comprehend the importance of Pearson to the national transportation system, Table 1 indicates percentage of the Canadian total of the 3 factors discussed above that Pearson handles.

TABLE 1

Percentage of Canadian Total
LBPIA Traffic

Factor	% of Canadian Total (1987)
Itinerant Aircraft Movement	19.2
Enplaned and Deplaned Passengers	32.1
Enplaned and Deplaned Cargo	43.5

More than 50 airlines at LBPIA carry passengers and cargo to more than 300 destinations in 60 countries.

Given the importance to the total aviation system, capacity constraints at Pearson can, and do, affect the Canadian aviation system, with attendant international repercussions.

In fact, a morning delay of one flight at Pearson will, by the end of the day, have caused delays at as many as five or more Canadian and other international airports.

The air transportation mode has displaced rail as a mass travel medium, and it is expected that by 1995, if current growth rates hold, more Canadians will fly than ride intercity buses and trains combined. Three of every ten passengers in Canada utilize Pearson, and it is estimated that six our of every ten people in the Toronto area fly in or out of Pearson at least once a year. Thus, unless steps are taken to address the capacity constraints at Pearson, it can be expected that the repercussions will affect all Canadians, and weigh most heavily on these in the Toronto region.

SECTION 2.0

THE CONGESTION PROBLEM

2.1 THE PROBLEM

The growth in aviation over the past 5 years, coupled with the decision to restrict the airside infrastructure expansion, has lead to problems of congestion at LBPIA.

Since 1987, air traffic demand has exceeded runway capacity for an increasingly large number of busy hours. In 1988, this problem was compounded by a shortage of air traffic controllers. An hourly capacity limitation was introduced in order to alleviate the congestion conditions that existed.

The problems are not new, but they became sufficiently serious in 1988 that, by year's end, airside congestion was causing delays and more importantly, the safety and integrity of the air transportation system were being questioned.

This inadequacy of airfield facilities compounded by the shortage of air traffic controllers has caused widespread frustration and economic penalties due to the delays of up to 4 hours in departures and/or arrivals. The resultant congestion problems that occur in the air terminal buildings, the parking garages, and the loss of conventions to the Toronto area are examples of the penalties being paid for lack of adequate airport facilities.

2.2 FACTORS

2.2.1 Growth in Demand

Table 2 indicates the air traffic demand predicted at LBPIA in the medium-term future.

TABLE 2

Planning Aircraft Movement Volumes
Lester B. Pearson International Airport

Year		Annual Volume	Planning Day Volume	Planning Peak Hour Volume
1988		348,400	1150	80-95
1996	Low	356,000	1200	85-100
	Medium	418,000	1400	100-110
	High	485,000	1600	110-125
2001	Low	379,000	1275	90-105
	Medium	459,000	1500	105-120
	High	541,000	1800	125-140

Over the past five years enplaned and deplaned (E&D) passenger traffic has increased over 40% from 14 million to 20 million at Pearson, and aircraft movements have risen from 240 thousand in 1983 to nearly 350 thousand in 1988. The change in composition of these movements over the last 5 years in terms of air traffic segments is shown in Table 3.

TABLE 3

Comparison of
1983 and 1988 Air Traffic Movement Segments
Lester B. Pearson International Airport

Segment	1983 %	1988 %
- Air Carrier (over 35 tonnes)	62.1	59.7
- Commuter/Feeder Air Carriers	7.3	21.7
- Commercial Traffic to General Aviation Area	13.2	7.2
- Private Canadian Aircraft	8.0	4.9
- Private Non-Canadian Aircraft	6.2	4.9
- Other	3.2	1.6

During the past several years there has been a dramatic rise in the use of the airport by feeder air carriers, due to the change in requirements that allow airline access to an airport as defined by the National Transportation Act (1987). For example, in 1985, there were 41,300 feeder air carrier movements, while in 1988 this number had increased to approximately 75,600 (75% increase). During the same period, the air carrier movements over 35 tonnes increased from approximately 170,000 to 205,000 while, due to access limitations, the movements utilizing the general aviation area decreased from 78,500 to 67,000.

Two peak periods exist at LBPIA as indicated in Annex 5. The smaller peak occurs between 0700 and 1000 hours in the morning, when the hourly volume ranged between 70 and 80 movements per hour in 1988. The major peak period occurs between 1500 and 2000 hours with typical peak hour volumes in 1988 ranging from 80-95 movements per hour.

These historical demand numbers existed within the constraints of traffic management initiatives that were in place in 1988, and which continue to be in place. At times, inbound flights from airports within a given radius (302 nm in 1988) are delayed on the ground at the departure airport, are issued a time when they can expect clearance to Pearson, to ensure that arriving aircraft volumes accord with available capacity. As well, restrictions on VFR (Visual Flight Rules) traffic and charter traffic activity are other examples of such traffic management initiatives.

Further, as indicated in Table 2, the peak-hour demand is projected to increase to between 100 and 135 movements per hour by 2001. This future demand will result in a steady deterioration in the level of service available at the airport, as the airside infrastructure will become increasingly inadequate to handle the growing demand. The impact of this airside congestion on the other airport systems will result in ground access problems, terminal crowding, and parking congestion.

2.2.2 Existing Runway System Capacity

The airside capacity of LBPIA is given in Table 4.

TABLE 4

Runway Capacities
Lester B. Pearson International Airport

Runway System	Meteorological Conditions	% Availability *	Movements Per Hour
06L/24R;06R/24L	Full VMC	80%	90-95
06L/24R;06R/24L	IMC	94%	80-85
15/33	IMC		40-42

* The primary factors which influence the number of hourly aircraft movements attainable at Pearson include mix of aircraft types and weather conditions.

Aircraft Mix

The capacity of a runway system is highly dependent on the mix of aircraft which uses the facility. The mixing of aircraft which are not compatible in terms of aircraft size and performance capability creates the need to increase separation between consecutive arriving and/or departing aircraft and results in a decrease in the number of movements which can be accommodated in a given period.

There is a considerable amount of incompatibility in the mix of aircraft currently operating at LBPIA. This is due to the fact that, in addition to being a major international airport with significant utilization by the largest passenger jet aircraft, LBPIA is also a primary "hub" airport for the two major Canadian carriers. As such, smaller feeder aircraft which connect with the larger jets used for long haul flights and serve the smaller communities of Ontario, utilize LBPIA in order that the people of these communities may be offered access to the National and International Air Transportation System.

The population sizes and distribution in the cities and towns within the "hub" catchment area of LBPIA suggest that smaller aircraft in the 30 to 75 passenger range will continue to be the typical feeder aircraft. Therefore, no substantial change in the aircraft mix to be accommodated at LBPIA is anticipated.

Weather Conditions

Among the weather conditions that can affect airport operations, visibility and wind direction are critical, particularly for LBPIA.

a) Visibility

Visibility conditions and cloud ceiling heights determine whether the airport will operate under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR), which in turn govern the air traffic control (ATC) procedures to be applied, including the separation between successive aircraft operations. IFR procedures under Visual Meteorological Conditions (VMC, i.e., good visibility and high ceiling) permit more flexibility in the spacing of aircraft. As the visibility and/or ceiling is reduced to Instrument Meteorological Conditions (IMC), ATC procedures require greater separation between aircraft and, as a result, runway capacity is reduced.

VMC exists when horizontal visibility is 3 statute miles or greater and the cloud ceiling is 1000 ft. or higher. The opportunity for even greater flexibility in ATC procedures to maximize runway utilization occurs when weather conditions are above minimum VMC. "Full VMC" exists when the visibility criteria of horizontal visibility and ceiling exceed 5 statute miles and 2500 ft. respectively.

b) Wind Conditions

Wind direction is a primary factor because there is only one runway aligned in the northwest-southeast direction, (i.e. runway 15-33) and ATC rules allow controllers to offer pilots use of a runway only if the crosswind component is less than 25 knots, and runway conditions are clear and dry. When runway conditions are such that surface contaminants exist (e.g. snow, ice) the acceptable crosswind should be reduced in order to maintain a safe operation.

Thus, when wind speed and direction result in higher than allowable crosswinds on the 06-24 parallel runways, the airport is reduced to the capacity afforded by the single 15-33 runway.

2.2.3 Airline Operations

Once freed by regulatory reform in 1987, the airlines instituted new operating and pricing strategies. The impact of these practices in Southern Ontario has been a shift to "hub and spoke" style operations. Under this concept, air carriers concentrate their services at a few strategically located "hub" airports, and provide frequent, convenient jet service between these "hubs". The passengers of these carriers are "fed" into the hub airport from smaller sites utilizing what have become known as "feeder" airlines. These feeder airlines use turbo-prop or small jet aircraft and coordinate their schedules with the larger carriers such that the passenger traffic is concentrated over relatively short time periods. This concentration of flights facilitates connections, increases the number of destinations that can be offered to the public, optimizes the utilization of aircraft, and leads to more competitive fares.

The geographic location of Toronto, its large local market, and its proximity to the U.S. market, make LBPIA a natural selection as a "hub". Having established LBPIA as their major "hub" in Canada, the major carriers have sought to increase their presence at this site. Thus, on a daily basis, approximately 1/3 of all take-offs and landings in Canada by scheduled air carriers occurs at LBPIA, and the site also accommodates 1/2 of all overseas flights arriving and departing from Canada.

As a result of the introduction of "hubbing" in North America, several related developments have occurred that impact on runway capacity at "hub" airports. Firstly, air traffic demand for runway capacity has rapidly accelerated. Secondly, average aircraft size has stopped growing. For example, between 1978 and 1982 the average size of aircraft in North American domestic operations grew from an average 135 seats per aircraft to 150 seats per aircraft. But, since the introduction of deregulation in both the United States and Canada, the average aircraft size has remained static. The recent pattern of worldwide aircraft orders has shifted towards smaller aircraft, such that the average size of the world fleet of passenger aircraft early in the next century may be as low as 185 seats, which is lower than the industry predicted average of 220 that was forecast as recently as 2 years ago. Thirdly, load factors remained static due mainly to the competitive forces in the market. The fourth development has been a change in operational pattern that has increased demand for peak-hour landings and departures.

Air carriers have met increases in passenger demand by increasing frequencies of flights, using smaller aircraft, and changing load factors. These phenomena have provided increased flexibility and convenience for passengers, they have also resulted in runway capacity problems.

2.2.4 Air Traffic Services

A shortage of air traffic controllers at Pearson has developed over the last several years. As a result, the air traffic control system has been put under considerable stress.

The shortage of air traffic controllers is being addressed on a priority basis and a number of initiatives are under way. The department has hired and will continue to recruit up to 45 experienced air traffic controllers. New candidates are being recruited to be trained at the Transport Canada Training Institute in Cornwall, Ontario. The training capacity at the institute has been increased beyond 260 students, and the intended capacity for 1990 is 312 students.

In parallel with these measures, a new traffic flow management system is being evaluated at Toronto to permit more accurate prediction of the demand on the Toronto air traffic control facility. This will allow more effective management of controller workload and efficient funnelling of inbound aircraft demand to match available system capacity. Procedural changes are being implemented to improve the efficiency of air traffic movements. Changes in operating techniques, airspace "sectorization" and routings during the next two years will further enhance system integrity, efficiency and effectiveness. A state-of-the-art radar system has been commissioned at Hamilton to serve the Toronto area. The advanced Canadian Automated Air Traffic System, is being constructed for installation at Pearson commencing in 1995. This project will place Canada at the leading edge of air traffic control automation and will allow for aviation growth into the 21st century. However, in order to obtain the benefits of these improvements, the physical capacity of the runways at LBPIA will require upgrading.

2.3 SUMMARY

The factors contributing to the congestion problems at Pearson are:

- increased levels of demand for air travel in response to a buoyant Southern Ontario economy
- success of the lessened economic regulatory environment under the new National Transportation Act
- air carrier route rationalization and use of "hub and spoke" networks
- a shortage of air traffic controllers
- insufficient runway capacity at Pearson International Airport, particularly under IMC or with strong north/south winds.

The air traffic controller shortage is being dealt with by increased staffing and training of new controllers. Additionally, by the mid-1990s state-of-the-art equipment will be installed to further assist in air traffic control.

The existing runway system, while able to handle 1988 volumes of traffic under "full VMC", was inadequate under IMC and when runway 15/33 is dictated by winds. By 1996 the existing runway system will not be able to adequately support the levels of demand anticipated. The shortfall in capacity will continue to grow.

SECTION 3.0

PERSPECTIVE ON THE PROBLEM

3.1 INTRODUCTION OF THE "CAP"

On December 12, 1988, due to the increasing magnitude of flight delays occurring at the time, and in anticipation of the Christmas peak period, the Minister of Transport introduced an aircraft reservation system at LBPIA. The system was designed to ensure the integrity of air navigation and to reduce the large number of flight cancellations and delays at LBPIA.

The system placed a ceiling or "Cap" of 70 flights per hour on the maximum number of aircraft allowed to land at or take-off from LBPIA during designated hours. Air terminal based scheduled and charter flights are allowed up to 66 of the 70 available "slots" per hour, while the remaining sectors of aviation are allowed 4 "slots".

While this system resulted in reductions in flight delays, there has been opposition to the continuation of this measure on a long-term basis from the airlines, other aviation companies and business aircraft owners, owing to the resultant financial hardship to the users, the constraint it places on growth, and lack of acceptable alternative facilities, all of which impact on the system's ability to serve the public.

Although the reservation system was announced as a temporary measure to ease the heavy congestion at the airport during the 1988 Christmas rush, the system has now been extended until such time as the capability and capacity of the airfield and air navigation system can be assured.

3.2 MINISTERIAL CONSULTATIONS

Given the severity of the congestion problem and recognizing that the "Cap" does not provide a permanent solution, the Minister of Transport and the Minister of State for Transport consulted approximately 65 groups in the Spring of 1989 and they received a number of submissions on the problems at LBPIA and other airports in the Toronto area. The meetings and opinions reflected the views of a wide cross section of the various communities affected, directly or indirectly, by the airports in the Toronto area. The groups consulted offered various solutions to the congestion problems at LBPIA and, although developed from different points of view and interests, the solutions generally fell into the following areas:

- better management and use of LBPIA's present facilities and tighter control of its users;
- controlled expansion of the Pearson airport system, with appropriate consultation;
- improved communications (between government, users and the surrounding communities); and
- better and increased use of other airports in the area, with expansion as appropriate.

In the discussions concerning LBPIA, the airport's users urged that the site be developed to its optimum, that additional airside facilities be provided and that the "CAP" be removed or at least the reservation slots be increased as soon as possible. The local governments recognized the economic value of LBPIA to their communities, and while generally acknowledging expansion as inevitable for continued economic growth, were concerned about its impacts. They urged tighter control of the airport's operations and full consultation on any expansion proposals. The residents surrounding the airport were apprehensive about the effect of further expansion on their perceived deteriorating quality of life, and urged tighter control of operations and consultation on any future development.

SECTION 4.0

OPTIONS FOR CONGESTION RELIEF

4.1 ECONOMIC AND POLICY CONSIDERATIONS

In addressing the problem of airside congestion in Southern Ontario the economic and regulatory policies of the government play an important role.

The government is pledged to deficit reduction through tighter fiscal policy, expenditure restraint and cost recovery. The government is also committed to regulatory reform of the transportation sector of the economy. These policies are all aimed at building a foundation for a stronger, more efficient and more competitive economy.

The government considers that cost recovery is a very important element of its management philosophy, as it provides a method for greater fairness and equity in financing activities. At the same time, a business-like approach to the provision of services precludes the expenditure of funds where the price of the service to be borne by the user becomes a disincentive to the utilization of that service. The cost recovery policy is directed at producing operational efficiencies by focusing attention on costs, such that better service is provided while expenditures are minimized.

The government is fostering domestic competition in all sectors of the economy, and has set about reducing barriers to trade and establishing policies to remove impediments to economic growth. In terms of airport congestion, the lack of airport facilities leads to an uncompetitive environment as existing airport users, through existing leasehold and land interests, may effectively prevent new users from servicing the market.

The above policies have led to several considerations with respect to the aviation congestion problems in the Toronto area:

- new infrastructure should only be provided when it can be demonstrated that the users of the system are prepared to bear the associated costs and positive net socio-economic benefits are achievable

- the use of existing infrastructure should be optimized in terms of productivity and socio-economic benefit

- cost recovery of financial investments are encouraged for facilities, thus any new facilities will be required to balance cost versus the user's willingness and ability to pay

- competition between users of the facilities is required, and thus solutions should not place any user at a competitive disadvantage versus other users

The government's policy stated in "Freedom to Move", and subsequently enacted in the National Transportation Act (1987), does not allow restrictions to be placed on domestic air carrier licences in southern Canada. Rather, the test of "fit, willing and able" is applied when granting licences, and it was, and is, the market place that is the arbitrator

of services provided. The current congestion problem is seen as limiting the realization of this legislation due to the constraints imposed by limited peak hour capacities. In addition, arbitrary government intervention in the market place through other regulatory mechanisms may be seen as substituting one set of regulations for another, with the end result being re-regulation of the air industry.

Any examination of the solutions to the congestion problems should consider the social, economic, environmental, and regulatory impacts that would be induced by a solution, and every effort should be made to minimize the potential adverse consequences.

4.2 OPTIONS

In considering the congestion problems at LBPIA, the following short and medium term options were examined:

(i) Do Nothing
(ii) Limit Access to LBPIA
(iii) Improve Efficiency
(iv) Introduce Pricing Mechanisms
(v) Divert Traffic to Other Airports
(vi) Add Airside Capacity at LBPIA

Each of these options is more fully described below.

4.2.1 "Do Nothing" Option

This option would see Transport Canada taking no further action regarding the capacity shortfalls in the Toronto area. However, if this course of action was to be followed, it is expected that the air carriers would reconsider their operational strategies in the Toronto area and move their hubs to other airports. This option would have negative economic consequences for the Toronto area including restricted access would also preclude airlines from providing services that meet the needs of the travelling public and the inability of new airlines to obtain "slots" for new services in sufficient quantities to compete with established carriers.

4.2.2 Limit Access to LBPIA

This option would see long-term extension of the principle of capping the movements at LBPIA. While the current system has significantly reduced delays, opposition to its continuance has been voiced by the aviation industry.

There are two major problems with any protracted application of access controls in a deregulated environment. The first problem is that capacity control mechanisms generally lead to a lessening of competition, through oligopolistic control of scarce runway resources. Thus, the use of the airport by a new airline, or expansion of service by a non-major carrier may be hindered due to the scarce runway resources being tightly held by the incumbent major airlines for "schedule periods". The second problem is that scarce runway

resources tend to militate against area economic development. These problems lessen the airport's ability to serve the travelling public or other area airports.

Reservation systems also imply a guarantee of capacity which must therefore be set at a readily achievable number of movements. Under such a system, unused capacity on VMC days may go unused. At the same time, on unfavourable days, the capacity is not available to service the reservations made. In the short term, the system brings order, but in the longer term it imposes economic penalties.

Notwithstanding the above, an appropriate "CAP" on movements should be maintained to ensure the reliability of the system for the travelling public, but discontinued as soon as the capacity and capability of the systems at LBPIA are increased significantly to allow the movement of more air traffic.

4.2.3 Utilization Improvements

A comparison of Pearson and other world airports has been undertaken. The analysis of the air traffic at these airports indicates that several variables determine the ultimate capacity of the available runways, with the most critical being aircraft mix. Table 5 compares the 1988 traffic figures from several world airports and LBPIA.

TABLE 5
1988 Airport Traffic at Various Airports

Airport	No. of Runways	No. of Simultaneous Operating Runways (High Capacity Configuration)	Total Aircraft Movements	Movements per Runway in High Capacity Configuration
LBPIA	3	2	348,700	174,400
Chicago-O'Hare	7	5	803,500	160,700
Atlanta	4	4	778,800	194,700
Dallas-Ft. Worth	6	5	675,100	135,000
Denver	6	4	503,100	125,800
Los Angeles	4	4	622,400	155,600
Gatwick	2	1	197,600	197,600
Heathrow	3	2	351,800	175,900
New York-JFK	5	2	330,100	165,000
New York-Newark	3	2	380,100	190,100

This table indicates that the airside productivity at LBPIA is comparable to other world airports, when air traffic services are fully staffed. In point of fact, LBPIA handles as much aircraft traffic as Heathrow, and more than JFK.

Thus, while minor efficiencies could probably be gained at LBPIA with changes in ATC procedures, the above review indicates that the existing use of the airside at LBPIA is as efficient as other international airports, given the traffic mix which LBPIA serves, and the weather conditions that exist.

4.2.4 Pricing Mechanisms

Peak period pricing is often suggested as a mechanism for reducing demand in the peak hours. It has several positive attributes, but is also subject to criticism based on its application.

The major positive aspect of peak period charging is the encouragement it provides to price-sensitive users of the airport facilities to move to off-peak periods or to other airports. However, many users of lower performance or smaller aircraft may prefer to pay these charges rather than change their operations.

Peak period charging does not significantly reduce peak period operations by the major airlines. Airport user charges typically represent between 3% and 5% of airline operating costs. Thus the economic advantages of operating during periods of peak demand outweigh the additional costs imposed on airlines by peak period charges unless these charges imposed are extremely high.

An analysis of peak period charging at LBPIA, indicates that approximately 5% of the peak hour traffic that currently exists could be shifted through the introduction of a peak period charge. This shift would most probably take place in the feeder segment of aviation traffic as both the major airlines and corporate users would not be deterred from using the facilities by this type of pricing.

The 5% reduction in traffic could, in theory, reduce the mean 1988 peak hour traffic from 87 to 83 movements per hour. This would have reduced the number of busy hours, when demand exceeded capacity, in 1988 and thus has some merit as a short-term solution to the existing capacity shortfalls.

Increasing fees for lower performance aircraft and/or smaller aircraft, including feeder services, may also reduce the access to the national air transportation system for small communities which are typically served by such feeder aircraft.

Peak period pricing is part of the short-term strategy for demand management at the airport.

4.2.5 Diversion to Other Airports

Of the 52 land-based airports within 80 kilometres of downtown Toronto (see Annex 7), at least six (6) airports have some potential to play a role in resolving the congestion problems currently brought about by the increasing aviation activity in the Toronto area. These six airports are:

Lester B. Pearson International Airport

Hamilton Civic Airport

Toronto Island Airport

Oshawa Airport

Buttonville Airport

Downsview Airport

4.2.5.1 Airport Capability to Accept Diverted Traffic

The ability of the above airports to accept air traffic diverted from LBPIA is discussed below.

1. Hamilton Civic Airport

Hamilton Civic Airport has 3 runways, the longest of which is 2,440 meters (8,000 feet). It has the facilities to accept all types of traffic, but the distance that can be flown from Hamilton by various large high-performance aircraft is limited due to the runway length.

Hamilton is able to accommodate all short and medium-haul traffic, but if a full service airport capable of servicing non-stop trans-oceanic flights is desired at this site, at least one runway would require extension. Further, the addition of trans-oceanic or other eastbound flights would cause conflict in the north-east Toronto airspace.

Hamilton Civic Airport is also limited due to its ground access and the Province is currently completing the environmental studies necessary to upgrade this access in the future.

Thus, although Hamilton has limitations, it could be upgraded to accept air traffic from LBPIA.

2. Toronto Island Airport

Toronto Island Airport has 3 runways, the longest of which is 1,220 meters (4,000 feet). It has the facilities to accept several types of traffic, with limitations, due to runway length. The Island Airport also has restricted access, in that the only access to the site is by ferry.

The operation of the airport is governed by a Tripartite Agreement (Federal, Municipal, Toronto Harbour Commission), which has two stipulations that limit the site's ability to provide any congestion relief to LBPIA in the short to medium-term. These two conditions are:

(i) jet-powered aircraft are prohibited from using the airport; and

(ii) no new runways or extensions to the current runways will be permitted.

In the longer-term, the problems of access to the Island, and the restricted area of the airport mitigate against its use by large aircraft. Given the above, the Island Airport has limited potential to relieve congestion at LBPIA.

3. Oshawa Airport

Oshawa Airport has 2 runways, the longest of which is 1,060 meters (3,476 feet). It has the facilities to accept several types of traffic with limitations due to the runways and the available navigational aids. The airport would also require extensive rehabilitation to serve any expanded role. Essentially, Oshawa Airport is not equipped to serve increased traffic, especially commercial passenger traffic. Oshawa Airport is also severely limited in terms of growth potential due to the impingement of surrounding neighbourhoods, and the increasing resident opposition to the site due to perceived noise and safety concerns. This airport has limited potential to relieve congestion to LBPIA.

4. Buttonville Airport

Buttonville Airport is a privately owned facility which has 2 runways, the longest being 1,143 meters (3,750 feet). It has the facilities to accept several types of traffic compatible with its runway length.

The site is not amenable to expansion given the urbanization of peripheral lands. Even if these lands were available, the lengthening of runways and installation of precision instrument navigational aids would require re-aligning Highway 404 and/or 16th Avenue, removal of some airport buildings, and reconstruction of some airport surfaces. Thus, this site has limited potential to relieve the congestion at Pearson.

5. Downsview Airport

Downsview Airport is located in the runway approach paths for Pearson Airport. Thus, an IFR departure/arrival movement at Downsview would preclude an IFR arrival on runways 24L and 24R, and/or a departure from runways 06R and 06L. However, a limited air carrier operation could be carried out at this site. The use of Downsview would require specific approach/departure procedures that are only suited for specific aircraft types, and would require a microwave landing system combined with curved approach techniques. This type of operation is suited for a company approved approach rather than a public approach. Therefore, any use of Downsview would be so restrictive that the capacity gains would be insignificant.

4.2.5.2 Potential for Transfer of Air Traffic

The air traffic utilizing LBPIA can generally be categorized as:

(i) Scheduled Domestic Air Carriers
(ii) Scheduled Foreign Carriers
(iii) Other Commercial Operators
(iv) Non-Commercial Activity
(v) Charter Traffic

The potential for transferring these traffic segments is discussed below.

(i) Scheduled Domestic Carriers

Canadian-owned airlines offering scheduled services account for 64% of the traffic at LBPIA. The central issue underlying traffic transfer initiatives for these airlines is their continuing freedom to provide service on routes between domestic airports of their choice.

Any transfer of scheduled feeder traffic to other airports would operate to the competitive disadvantage of the major Canadian carriers by inhibiting their ability to "feed" onward-bound longer haul passengers to their own flights. The feeder carriers would also be concerned about losing passengers from closer airports (e.g. Sarnia, London) who, faced with a costly and time-consuming transfer, might choose to drive to LBPIA or a U.S. airport. This would in turn, result in reduced flight frequencies and a consequent loss of patronage from those passengers who would continue to fly if given acceptable levels of service.

(ii) Scheduled Foreign Carriers

Flights by scheduled foreign airlines constitute approximately 14% of LBPIA's total aircraft movement activity. Such scheduled flights are normally operated in accordance with specific bilateral agreements which identify the airports of call in both countries. Any attempt to abrogate or alter such agreements by relocating a foreign airline to a less

favourable airport would, in all likelihood, be met with punitive retaliatory measures to the bilateral Canadian airline by the host country of the affected airline. The cost, in terms of reduced market share to Canadian airlines flying to secondary airports (with inconvenient connections) and, in terms of inconvenience to Canadian passengers, would be higher than any benefits derived.

(iii) Other Commercial Operators

Approximately 7% of commercial aircraft activity at LBPIA is conducted by a mix of small carriers providing passenger, courier and small cargo services and LBPIA-based aircraft operators offering specialty charter and other services. A large proportion of this traffic owes its viability to its interaction with the larger air carrier operations, e.g. cargo transfers and specialized charter services for passengers, available services from brokers, forwarders, trucking companies and Customs, all of which are based at LBPIA. LBPIA has become the focus of a large multi-modal goods transportation capability for the region. Operators of these services argue that, for them, relocation would have serious financial impacts.

Many of the other commercial operators are Fixed Base Operators (FBOs) or other airport tenants who have invested heavily in plant and equipment on-site and in the vicinity of LBPIA. The FBOs hold long-term land leases on-site to provide aircraft parking, hangarage, fuelling and various other services to their tenants.

(iv) Non-Commercial Activity

The vast majority of the 11% of aviation activity at LBPIA that is defined as "non-commercial" which includes private and corporate aircraft is carried out directly or indirectly in support of commercial or business pursuits.

Sixty percent of the non-commercial activity is carried out by jet-powered or high performance turbo-prop aircraft owned by business corporations or by operators providing such services to them. These aircraft could not operate consistently with an adequate margin of safety at any other area airport but Hamilton. However, the majority of passengers on such flights are headed for the Toronto city centre and for such travellers, diversion to Hamilton would increase trip time by about an hour.

Further, the view of the corporate aviation segment is that the potential for economic benefit to the Toronto area is greater, given the business objectives of their visits, than that of most other competing traffic segments. From the perspective of the area municipalities, such benefits may not be derived in similar measure from the operations of other aviation segments, e.g. the feeder airlines.

(v) Charter Traffic

Charter traffic has 3 separate elements that must be considered when contemplating diversions. These elements are:

(i) Charter Type Seats on Regularly Scheduled Flights

(ii) Charter Flights by Regularly Scheduled Airlines

(iii) Pure Charter Operations

These latter two categories represent 4% of the aircraft traffic at Pearson, and they are presently not allowed to operate in the peak hours. Each of these elements is discussed below.

(i) Charter Type Seats on Regularly Scheduled Flights

Regularly scheduled airlines generally sell "charter-type" seats on their scheduled flights in order to increase load factors during off-peak travel times. Significant volumes of discount fare passengers of major airlines travel on the same flights as full fare passengers using a variety of tickets whose terms and conditions span the spectrum between scheduled and charter. Attempts to force physical separation of discount and full fare passengers onto separate flights would negate the market segmentation initiatives used by all scheduled airlines to maximize load factors and to remain economically viable. The prevention of this type of activity would also not lessen the congestion problem as the flight would generally proceed with lesser loads of passengers paying regular fares.

(ii) Charter Operations of Regularly Scheduled Airlines

A ban on scheduled carrier charter flights at LBPIA would cause Canadian and foreign airlines with scheduled rights to vacation destinations to add scheduled services to attract "charter" passenger demand to their scheduled service. This would result in a significant gain in passengers to Air Canada and the foreign airlines, mainly at the expense of air carriers which do not have rights to operate scheduled service, but which offer all charter service to these destinations, e.g. carriers such as Worldways, Canadian Airlines International and Odyssey Airlines.

The transfer of scheduled airline charter traffic could also tend to defeat the purpose of the transfer due to the requirement to reposition aircraft from LBPIA to another site. Virtually all of the transborder and international charter flights by scheduled airlines, utilize aircraft which are primarily dedicated to scheduled service. Thus, many charter flights by scheduled airlines which originate out of Pearson would have previously landed as a scheduled flight. Consequently, if charter activity was transferred, aircraft of scheduled airlines would depart LBPIA empty to pick-up charter passengers at another site. Thus, minimal aircraft movements would be eliminated.

(iii) Pure Charter Operations

Canadian pure charter operators which carry 75% of the pure charter passenger traffic have made clear their reluctance to move from LBPIA. They have two concerns. The first is that relocation increases ground travel times for the majority of their potential clientele who come from the centre of the lucrative Toronto market. This would place them at a serious competitive disadvantage with the charter or "reduced fare" seats offered by the scheduled airlines based at LBPIA. The second concern is the potential loss of the small, but marginally significant, proportion of connecting passengers which they randomly capture because of the frequency of flights and magnitude of the passenger traffic at LBPIA.

The charter airlines have claimed that, if they are to be transferred, charter and "charter type" passengers of scheduled airlines should also be transferred.

The concerns of the pure charter airlines are supported by the fact that these airlines continue to operate (and their number to grow) at Pearson even though they are forced to fly at hours which are unpopular with passengers. Over the last three years, pure charter flights have not been permitted between the hours of 1500 and 2000, which are the hours of peak airport activity. Consequently, these flights have minimal impact on airport facilities, particularly runways, during those periods when these facilities suffer from capacity overload. Thus, such traffic transfers would provide no significant relief to the runways and other facilities at LBPIA.

4.2.5.3 Summary of "Diversion" Options

The limited options currently available for traffic relocation from LBPIA include the charter aircraft operations of scheduled and charter airlines and operations of feeder airlines, corporate business and "other commercial" operators.

The viability of these options in the short and medium-term is compromised by limitations in runway length, size, services, expandability and accessibility at Hamilton, Toronto Island, Buttonville and Oshawa Airports. The additional services at these sites, depending on the volume of traffic involved, could also require significant changes to the manner that Air Traffic Services presently provides service to these sites. More importantly, these options do not provide any significant relief to peak hour demand. Thus, the transfer of air traffic will not have any impact on the need for new airside facilities at LBPIA in the medium-term (to 1996).

4.2.6 Additional Airside Capacity at LBPIA

The preceding discussions have indicated that the currently available alternatives to limit or divert existing demands are limited and short term in nature.

For the medium and long term, the projected growth in aviation demand requires that action be taken to provide relief.

The forecasts in Table 1 implicitly assume that existing traffic management initiatives to discourage certain air traffic segments during peak periods would remain in place (excluding the "Cap"). Thus, VFR traffic for example would continue to be excluded during such periods and peak period pricing would be in effect.

As diversion of traffic and other traffic management initiatives will not reduce the peak-hour demand at LBPIA, runway capacity will be required to accommodate Toronto area traffic demand until at least the turn of the century. This additional runway capacity is required not only to accommodate forecast demand, but to also provide an "all-weather" runway system which would permit acceptable levels of airside service to be maintained under adverse weather conditions. Solution of the congestion problem would require the construction of a third parallel runway in the 06-24 direction.

Additionally, the capacity shortfall situations which occur during conditions of strong north-west winds can only be relieved by the construction of a second runway in the 15-33 direction. As stated earlier, in its most restrictive form and when combined with wet or icy runways and poor visibility, the present runway throughput capacity is reduced to 40 hourly movements.

The new runways at Pearson will provide the interim capacity required until all other longer-term planning activities at both LBPIA and for the Southern Ontario area are completed.

4.3 PREFERRED MEDIUM TERM OPTION

In summary, the provision of two additional runways at LBPIA would appear to be the preferred option, one in the 15-33 direction and another in the 06-24 direction. Provision of these runways would ensure that adequate capacity exist at LBPIA until the end of the century. Even with these proposed expansions, periodic peak period shortfalls will again begin to occur by the turn of the century. As a consequence, major decisions will be required within the next two years on the long term future of LBPIA and the means of accommodating the various aviation segments serving the Toronto area at other airports.

In the longer term, airside capacity increases over and above those planned for the medium term at LBPIA will be required. The ability to serve the aviation needs of the Toronto region into the 21st century will depend upon optimizing the utilization of airports in Southern Ontario and, potentially, developing the Pickering site as an airport.

SECTION 5.0

THE STRATEGY

5.1 MINISTERIAL STATEMENT

Based on the preceding discussions, and in large part on the findings from their consultations, the Minister of Transport and the Minister of State announced on August 18, 1989 a strategy to deal with the growing congestion problems at Lester B. Pearson International Airport and the future growth of aviation in Southern Ontario.

The strategy as announced was that:

(i) Lester B. Pearson International Airport would continue to be the major airport for the area and be developed to its optimum social, economic, environmental and transportation capacity; and

(ii) other airports in the area would be developed in the long term according to a system-wide plan for Southern Ontario in which each airport would fulfil its respective role to meet future aviation demands.

This strategy is based on the inter-relationships that exist, and should be fostered between the area's airports and recognizes that expansion capability at Pearson is not unlimited.

The achievement of this strategy requires the adoption of short, intermediate and long-term measures which address the problems associated with the continued growth of aviation and the demands being placed on the current system.

In the short term (2 years), measures announced by the Minister deal with demand management and the planning required to enhance capacity. The demand management measures include negotiations with the airlines to transfer some pure charter traffic from Lester B. Pearson International Airport to Hamilton Civic Airport; introduction of "peak-period" pricing to encourage aircraft operators to land and take-off during off-peak air activity hours; and maintenance of an aircraft reservation system at Lester B. Pearson International Airport that limits hourly number of aircraft movements (landings and take-offs).

The planning process announced includes the planning for two new runways at Pearson and commencement of studies of Southern Ontario's long-term aviation requirements (including Lester B. Pearson International Airport) and the capacity enhancements required at each area airport to serve the growing aviation demand. The detailed news release announcing the strategy is presented in Annex 6.

The implementation of the results of the above planning processes constitute the intermediate and long-term measures announced by the Minister. It was the Minister's stated intention that the implementation of the strategy as defined would effectively prevent any recurrence of congestion problems in the foreseeable future for the Southern Ontario area. The implementation of any portion or portions of the results of these planning

processes are, however, dependent upon the conclusions and recommendations of the Federal Environmental Assessment and Review Process.

5.2 STRATEGY IMPLEMENTATION

Transport Canada has responded to the Ministerial statement by commencing action on an accelerated planning process that will deal with the continuing growth of aviation in the region, and will be sensitive to the needs of all parties.

Included in the initiatives underway are;

- Commencement of technical studies and an environmental review process for the proposed addition of two new runways at Pearson.

- Commencement of studies on Pearson's and Southern Ontario's long-term aviation requirements and the capacity of each airport in the region to serve these demands.

The Environmental Assessment and Review Panel which was formed pursuant to the Ministerial announcement will review the proposals resulting from these initiatives.

SECTION 6.0

THE NEXT STEP -

ADDITIONAL MEDIUM-TERM AIRSIDE CAPACITY AT LBPIA

6.1 RUNWAY OPTIONS AT LBPIA

The identification of the options for new runways at LBPIA includes several major studies that commenced only after the Minister of Transport announced the strategy for dealing with congestion problems on August 18, 1989.

These studies include technical assessments of runway location and capacity, environmental assessments, noise impact analysis, and socio-economic analyses. The studies to be undertaken include but are not limited to: Air Traffic Services Operations and Procedures, Air Traffic Control Equipment and Staffing Needs, Airspace Analysis, Airport Land Use Analysis, Electronic Aids Analysis, Engineering Feasibility Studies, and other environmental and ecological studies. Several of these studies are underway.

6.1.1 North-South Runway Options

Figures 1 and 2 show two possible areas for location of runways for the north-south direction. The configuration in Figure 1 (option 2) would allow a separation of up to 1200 feet that could give a capacity gain of up to 15 movements per hour. The configuration in Figure 2 (option 3) would allow a separation of up to 4500 feet, and this separation could effectively double the current capacity under conditions where the north-south runways is utilized.

6.1.2 East-West Runway Options

LBPIA currently has parallel runways in the East-West direction (06/24) that experience periodic capacity shortfalls which will become increasingly frequent in future years.

Two options for locating an additional runway in the East-West direction are presently being considered. These options are shown in Figures 3 and 4. A new runway in the area identified in Figure 3 (option 1), could be up to 2500 feet from the existing 06L/24R runway. The new runway in Figure 4 (option 4) could be up to 1200 feet from the existing 06R/24L runway. Depending on weather and visibility conditions, runway separation of 2500 feet could result in an hourly capacity increase of up to 30 movements, whereas a 1200 feet separation could result in a gain of approximately 15 movements per hour.

6.1.3 Runway Length

The east-west and north-south runway options are currently predicated on providing a runway length sufficient to accommodate all segments of the air traffic utilizing LBPIA. However, the operational and technical feasibility of shorter runways will also be examined.

These options are being pursued in greater detail at this time, as they appear to be the ones that will satisfy the existing demand in a manner which will provide adequate transportation services to the Southern Ontario area in the medium term.

6.2 EVALUATION CRITERIA

The assessment of these options will be undertaken in three broad areas:

(i) technical;

(ii) financial; and

(iii) environmental (including socio-economic).

These areas have not been priorized, but are to be considered holistically such that a balanced solution to the capacity problem will be achieved.

In terms of technical studies for the runways, an examination of several criteria will be undertaken including, but not limited to: runway capacity, aeronautical zoning, operational procedures, airspace configuration, soil analysis, drainage, and engineering feasibility.

The financial criteria will look at costs and revenues to be derived from each option by the airport, aviation and support industries.

In terms of the environment, several criteria will be examined including noise, environmental and ecological issues. In terms of socio-economics, the criteria to be examined will include the socio-economic costs and benefits of each option for Southern Ontario and the nation. It is expected that the Environmental Assessment and Review Panel will make recommendations concerning additional studies to be undertaken as part of the overall analysis.

FIGURE 1

Lester B. Pearson International Airport
Aéroport international Lester B. Pearson
GENERAL AVIATION AREA
OPTION #2
TERMINAL 3
CARGO
ATC CENTRE
AIRSIDE VEHICLE SERVICE ROAD
06R
24L
33
15
24R
750
500
250
0
250

FIGURE 2

Lester B. Pearson International Airport
Aéroport international Lester B. Pearson
750
500
250
0
250
24L
24R
15L
15R
33L
33R
06L
06R
CARGO
CARGO
TERMINAL 3
5TH LINE ROAD
OPTION #3
GENERAL AVIATION AREA
ARRIVE VEHICLE SERVICE ROAD

FIGURE 3

Lester B. Pearson International Airport
Aéroport international Lester B. Pearson
GENERAL AVIATION AREA
6TH LINE ROAD
OPTION #1
ATC CENTRE
TERMINAL 3
CARGO
AIRSIDE VEHICLE SERVICE ROAD
06R
24L
33
15
24R
18C
250
0
250
500
750

FIGURE 4

Lester B. Pearson International Airport
Aéroport international Lester B. Pearson
750
500
250
0
250
24L
OPTION #4
06R
33
CARGO
TERMINAL 3
CARGO
24R
15
5TH LINE ROAD
ATC CENTRE
GENERAL AVIATION AREA
19C

SECTION 7.0

BEYOND THE YEAR 2000

THE LBPIA MASTER PLAN
AND
THE SOUTHERN ONTARIO AREA PLAN

7.1 AFTER 2000

Even if new runways are provided at LBPIA in the medium term, indications are that capacity shortfalls will again be experienced early in the next century. Thus, the new runways presently being contemplated will only serve to provide the time necessary to put in place, both at LBPIA and in Southern Ontario, the facilities required to ensure that congestion in the future is avoided.

The strategy for Southern Ontario, announced by the Minister of Transport on August 18, 1989, stated:

> **"Lester B. Pearson will continue as the major airport for Southern Ontario, and be developed to its optimum capacity in terms of social, economic, environmental and transportation considerations. The other airports in Southern Ontario should be developed to respond to the immediate demands for aviation infrastructure and ultimately be developed to fulfil their roles within the area airports system and eventually supplement the role of LBPIA."**

In order to address this strategy, a Master Plan for LBPIA and an Area Plan for Southern Ontario will be developed.

7.2 LESTER B. PEARSON INTERNATIONAL AIRPORT - MASTER PLAN

Consistent with the strategy identifying LBPIA as the major airport in the Toronto area, the Master Plan will examine the options available for optimizing the facilities available at LBPIA.

The Master Plan for Pearson will be developed to cover at least a twenty (20) year planning horizon. It will examine the airport in the context of its ability to be expanded to accommodate the growth in aviation demand expected over the period. This growth will be defined in terms of the aviation sectors involved (e.g. commercial scheduled operations, charters, etc.) and passenger traffic in order to facilitate the identification of relocation options.

The plan will discuss the ability of the existing infrastructure (including any new runways) to accommodate the various segments of forecast aircraft traffic and increases in passenger activity. This will allow identification of any potential shortfall in facilities, especially on the airside. If the potential for a shortfall in capacity is determined to exist, the options for increasing it will be examined. The capacity enhancements will include examination of the airfield, terminal facilities, ground access and/or expected changes in technology. This portion of the plan will be subject to appropriate consultation with involved agencies and other levels of governments.

The output of these activities will also be subject to the Federal Environmental Assessment and Review Process, such that a physically, socially and environmentally balanced plan will be produced.

The Master Plan will identify the optimum capacity at Pearson, and thus define its ultimate role, and as a consequence the traffic that will utilize Pearson. The plan will also identify the air traffic that in the longer term could no longer be accommodated at Pearson and which will require the development of other sites in Southern Ontario.

7.3 SOUTHERN ONTARIO AVIATION PLAN

The planning for the Southern Ontario Aviation System, will recognize that all the airport sites in the area have a significant role in servicing aviation demands, both currently and in the future.

This plan will examine airports in Southern Ontario, including the Pickering lands, and will cover a twenty (20) year planning horizon. The process will be divided into 3 phases.

The first phase of the plan will consist of several steps that will

(i) Develop an inventory of the sites in Southern Ontario
(ii) Examine the aviation demand in Southern Ontario
(iii) Examine current capacity
(iv) Examine potential capacity
(v) Examine local and provincial plans to determine their impact on the sites.

The second phase of the plan will consist of analyzing the capability of each site to accept air traffic excluded from Pearson and be the subject of consultation with agencies and other levels of government.

The third phase of the plan will match the existing and potential capacity of the site(s) to their local demand, and the demand superimposed by the relocation of traffic from LBPIA. This activity will define the role of each site and the facilities required to serve this role.

As with the Pearson Master Plan, this process will be subject to the Federal Environmental Assessment and Review Process that will address the environmental considerations of the plan.

The resultant Southern Ontario Aviation Plan, will be a plan that balances the physical, social and environmental context of each site, and will also provide for a balanced system in terms of these concerns, such that aviation growth in Southern Ontario could be accommodated well into the 21st century.

ANNEX 1

LIST OF ABBREVIATIONS

ATB	Air Terminal Building
ATC	Air Traffic Control
ATS	Air Traffic Services
CAT	Category
EPS	Engineering Performance Standard
FBO	Fixed Base Operator
ft	feet
GA	General Aviation
IATA	International Air Transportation Assoc.
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
m	metre
nm	nautical mile
NTA	National Transportation Act
RVR	Runway Visual Range
sm	Statute Mile
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

ANNEX 2

GLOSSARY OF TERMS

Air Carrier Charter

Refers to charter flights in aircraft over 18,000 pounds performed by Canadian and foreign carriers with an official ICAO or Transport Canada designator.

Air Carrier Unit Toll

Refers to unit toll flights in aircraft over 18,000 pounds performed by Canadian and foreign carriers with an official ICAO or Transport Canada designator.

Air Terminal Building Traffic

See ATB Traffic

Aircraft Movement

A take-off, landing or simulated approach by an aircraft.

ATB Traffic

All air traffic utilizing Terminals 1 and 2 (and Terminal 3 in the fall of 1990) at LBPIA.

Ceiling

The lowest height at which a broken or overcast condition exists, or the vertical visibility when an obscured condition such as fog or smoke exists, whichever is lower.

Civil Aircraft

Any aircraft other than a military aircraft.

Commercial Aircraft

An aircraft operated or available for hire or reward.

Connecting Passenger

Passengers that deplane one aircraft and enplane another.

Corporate Aircraft

An aircraft operated by a corporation for the purpose of moving personnel and goods of that corporation.

Deplaning Passenger

Any person debarking from an aircraft at a specified airport.

Domestic Flight/Passenger

Movements/passengers at a Canadian airport departing to or arriving from a point in Canada and which, therefore, do not involve inspection services.

Enplaning Passenger

Any person boarding an aircraft at a specified airport.

Fixed Base Operator

A company providing a range of services to the aviation community including the parking, fuelling and servicing of itinerant and resident aircraft, hangarage and sometimes maintenance of both itinerant and resident aircraft and a range of facilities and services to visiting pilots and passengers such as ground transportation, communications facilities, lounges, meeting rooms, catering facilities and various flight planning facilities. A fixed base operator may also operate aircraft for charter purposes or under contract to other corporations.

IFR Flight

A flight conducted in accordance with the instrument flight rules (under IFR, flight is conducted with reference to electronic navigation aids and cockpit instrument displays).

IFR Conditions

See IMC conditions.

IMC Conditions

Weather conditions which prevail generally when the visibility or ceiling falls below the prescribed limits for Visual Flight Rules. Aircraft must be operated according to Instrument Flight Rules under these conditions. There are three categories of IMC conditions

Cat.1 IFR	Instrument Meterological Condition requiring aircraft operations under Instrument Flight Rules with a Runway Visual Range as low as 2600 ft and descent minima as low as 200 ft
Cat.2 IFR	Instrument Meteorological Condition requiring aircraft operations under Instrument Flight Rules with a Runway Visual Range as low as 1200 ft and descent minima as low as 100 ft
Cat.3 IFR	Instrument Meteorological Condition requiring aircraft operations under Instrument Flight Rules with a Runway Visual Range under 1200 ft and descent minima under 100 ft

In-Transit Passenger

See Transit Passenger.

International Flight/Passenger

Movements/passengers at a Canadian airport departing to or arriving from a point outside continental North America and which therefore require inspection services in the case of arrivals.

Local Movement

Aircraft which remains under tower control for the purposes of practising landings and take-offs or to conduct other local air work.

Movement

See Aircraft Movement.

Non-ATB Traffic

All air traffic into and out of LBPIA that does not utilize Terminals 1 and 2. This term does not relate to the function or type of flight but rather to the location on the airport at which the flight originates and terminates.

Originating Passenger

A passenger who begins his trip at the airport.

Other Commercial Flights

Flight performed by commercial aircraft operators not included in either Air Carrier Unit Toll or Air Charter categories.

Private Aircraft

A civil aircraft, other than a commercial or state aircraft.

Runway Visual Range

The maximum distance in the direction of take-offs or landings at which the runway or specified lights or markers delineating it can be seen from a position above a specified point on its centreline at a height corresponding to the average eye-level of pilots at touchdown.

State Aircraft

A civil aircraft owned by and exclusively used in the service of Her Majesty in the right of Canada or any province.

Terminating Passenger

A passenger who ends his trip at the airport.

Transborder Flight/Passenger

Movements/passengers at a Canadian airport departing to or arriving from a point in the United States and which therefore require inspection services in the case of arrivals.

Transit Passenger

Passengers who remain with the flight but who may deplane and enplane during the time required to service the aircraft.

VFR Conditions

See VMC conditions.

VFR Flight

A flight conducted in accordance with the visual flight rules (under VFR, flight is conducted with reference to the horizon, i.e. see and be seen).

VMC Conditions

Good weather conditions under which an aircraft can be operated by visual reference to the ground and to other aircraft. There are two categories of VMC conditions.

Full VMC	Visual Meteorological Conditions with at least 2500 ft cloud ceiling and 5 sm visibility

VMC	Visual Meteorological Conditions with greater than 1000 ft cloud ceiling and 3 sm visibility

ANNEX 3

LIST OF AIR CARRIERS
UTILIZING LBPIA IN 1989

Aeromexico
Alitalia
American Airlines
Business Express
BWIA International
Canadian Airlines International
Canadian Partners
China Airways
Eastern Airlines
Intair
KLM Royal Dutch Airlines
Mall Airways
Northwest Airlines
Olympic Airways
Pemair
United Airlines
Varig Brazilian
Wardair
Nationair
Worldways
Cal Air International
Finnair
Lufftransport
Martinair
Sterling Airways
Air Canada
Air France
Air Jamaica
Air Ontario
British Airways
Comair
Commuter Express
Cubana
Dominicana de Aviacion
El Al
Iberia
JAT Yugoslav Airlines
Korean Airlines
LOT Polish Airlines
Lufthansa German Airlines
Pakistan Airlines
Sabena Belgian Airlines
Swissair
TAP Air Portugal
Thai Airways
U.S. Air
Viasa Venezuelan Airlines
Voyageur
British Air Tours
First Air
Condor Flugdienst
Guyana Airways
Spantax

ANNEX 4

ECONOMIC IMPACTS CLASSIFIED BY SECTOR
Lester B. Pearson International Airport - 1987

ECONOMIC ACTIVITY BY SECTOR	DIRECT	INDUCED	DIRECT AND INDUCED	INDIRECT	TOTAL
Employment (No. of Jobs)	33,785	14,327	48,112	7,882	55,994
Airline/Airport Services	14,674	9,788	24,462	n/a	n/a
Freight Transportation	1,788	928	2,716	n/a	n/a
Passenger/Ground Transportation	1,109	387	1,496	n/a	n/a
Construction/Consulting	694	406	1,100	n/a	n/a
Visitor Services	15,520	2,817	18,337	n/a	n/a
Personal Income (Millions of 1987 Dollars)	$759.2	$910.2	$1,669.4	$198.0	$1,867.4
Airline/Airport Services	$518.8	$621.8	$1,140.6	n/a	n/a
Freight Transportation	$49.0	$59.0	$108.0	n/a	n/a
Passenger/Ground Transportation	$20.5	$24.6	$45.1	n/a	n/a
Construction/Consulting	$21.5	$25.8	$47.3	n/a	n/a
Visitor Services	$149.4	$179.0	$328.4	n/a	n/a
Business Revenue (Millions of 1987 Dollars)	$3,855.3	n/a	n/a	n/a	n/a
Airline/Airport Services	$2,447.7	n/a	n/a	n/a	n/a
Freight Transportation	$738.5	n/a	n/a	n/a	n/a
Passenger/Ground Transportation	$113.8	n/a	n/a	n/a	n/a
Construction/Consulting	$79.2	n/a	n/a	n/a	n/a
Visitor Services	$476.1	n/a	n/a	n/a	n/a
Tax Revenue (Millions of 1987 Dollars)	$380.4	$161.3	$541.7	$88.7	$630.4
Airline/Airport Services	$165.2	$110.2	$275.4	n/a	n/a
Freight Transportation	$20.1	$10.5	$30.6	n/a	n/a
Passenger/Ground Transportation	$12.5	$4.4	$16.9	n/a	n/a
Construction/Consulting	$7.8	$4.6	$12.4	n/a	n/a
Visitor Services	$174.8	$31.6	$206.4	n/a	n/a
Capital Investment (Millions of 1987 Dollars)	$73.1	n/a	n/a	n/a	n/a

NOTES:
a) Sector allocations are not available.

b) Indirect and induced Business Revenue impacts were not estimated due to the uncertainty associated with regional allocations.

c) Indirect and induced Capital Investment impacts are not available.

d) n/a denotes "not available".

ANNEX 5

TRAFFIC PEAKS

The air traffic pattern at an airport varies on an hourly, daily, and seasonal basis to accommodate passenger requirements and demands. This phenomenon is not restricted to "hub" airports, but it is accentuated at sites that serve as "hub" airports.

To determine the impact of the annual air traffic patterns on airport facilities, it is first necessary to define the relationship between the annual activity and volumes for a representative day. For analysis purposes, the representative or "planning" day for a given year is defined as a day where traffic is equivalent to that of the average of the seven busiest days in each of the three busiest months. Thus, the "planning" day reflects the characteristics of a typical busy day operation rather than the highest peak period.

The "planning" peak hour volumes for the airport are determined utilizing the "planning" day and historical information on hourly traffic patterns at the airport. In the case of LBPIA, review of this data indicates that two peak periods exist. The first peak occurs between 0700 and 1000 hours and the second occurs between 1500 and 2000 hours. Review of these peak periods over the past several years indicates that 52% of the daily traffic at LBPIA are processed during these hours, and that the average afternoon peak hour volume was generally 10-15% higher than the average morning peak hour volume.

This pattern is generally reflective of the nature of the traffic demand. The morning peak can generally be attributed to domestic and transborder business traffic as arrivals and departures correspond to the start of the business day. The afternoon peak can be attributed to close of business day activities super-imposed upon the demand brought about by international flights.

ANNEX 6

MINISTER'S PRESS RELEASE

No. 98/89 For release
August 18, 1989

AVIATION IN SOUTHERN ONTARIO -- A STRATEGY FOR THE FUTURE

Transport Minister Benoît Bouchard and Minister of State for Transport Shirley Martin today announced wide-ranging initiatives to deal with the increasing air traffic in southern Ontario.

These initiatives are part of a strategy in which:

- Lester B. Pearson International Airport continues to be the major airport for the area, to be developed to its optimum capacity; and

- other airports in the area are developed in the long term according to a system-wide plan for southern Ontario in which each will fulfil their respective roles to meet future aviation demands.

"To achieve this strategy, I have instructed my officials to begin an accelerated planning process immediately to deal with the continued growth of aviation in the region, sensitive to the needs of all parties," said Mr. Bouchard.

"Essential to this strategy are the following short-, intermediate- and long-term measures which address problems associated with the continued growth of aviation and the demand on our current system."

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Short-term Measures (within two years):

- Canadian Airlines International and Air Canada have indicated they will transfer some charter flights to Hamilton Civic Airport, Mount Hope, from Pearson. The federal government is prepared to further develop the infrastructure at Hamilton Airport to allow increasing use by the travelling public;

- top priority for renovation plans to Terminals One and Two at Pearson International Airport which, along with new Terminal Three to be completed by mid-1990, will give the travelling public three efficient, comfortable terminal buildings;

- a start on plans for a proposal for two new runways for Pearson. These plans will include technical studies and a public environmental assessment review of runway proposals;

- a start on studies of southern Ontario's long-term aviation requirements and the capacity of each airport in the region to serve those needs;

- immediate discussions with the aviation industry to introduce a fee schedule, known as "peak-period pricing," that would encourage aircraft operators to land and take off during off-peak air activity hours;

- maintenance of the 70-flight-an-hour cap on the number of arrivals and departures at Pearson as well as further refinements to the flight reservation system to improve on-time performance;

- continued recruitment of experienced air traffic controllers from other jurisdictions and expansion of enrolment in Transport Canada's air traffic controller course to 300 from 216 trainees at the department's Cornwall [illegible]nt., training institute; and

.../3

- a new noise-management approach, based on noise emission rather than aircraft type, to include legislative amendments this fall to raise fines to a maximum $10,000 per incident; new monitoring systems; encouragement of the use of quieter "Chapter 3" aircraft; publication of noise violations and enforcement actions.

Intermediate-term Measures (in 2 - 5 years):

- Construction of new runways at Pearson, depending on the results and conclusions of the environmental assessment; and

- continued priority for implementation of the national Radar Modernization Project (RAMP) and the Canadian Automated Air Traffic Services (CAATS) system.

Long-term Measures (more than five years):

- Continued implementation of recommendations contained in the master plan for Pearson and the plan for southern Ontario's aviation requirements, subject to results of the environmental assessment.

"It is clear there is a complex mosaic of regional concerns and special needs that also must be considered," Mrs. Martin said. "There are no fast, easy solutions to southern Ontario's aviation needs, but we are taking measured steps, in consultation with communities, users and industry, and other levels of government, to resolve a very complex issue."

Mr. Bouchard added, "I have already asked Environment Minister Lucien Bouchard to appoint an independent environmental assessment panel to review both short- and long-term solutions to aviation congestion problems in southern Ontario."

For information, the public may call 1-800-387-6753.

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(Air Traffic Control)
Transport Canada, Ottawa
(613) 998-6630

BACKGROUNDER

HISTORY

LESTER B. PEARSON INTERNATIONAL AIRPORT

The site of what is now known as Lester B. Pearson International Airport was chosen in 1937 and Malton Airport, with two hard-surface runways and a grass landing strip, was completed in September 1938. The first terminal building was the Chapman farmhouse near the Sixth Line (now Airport Road). A dedicated terminal building, identical to the one at Toronto Island, was constructed by the City of Toronto in 1939.

The first official landing at the airport was on Aug. 29, 1938, by an American Airlines DC-3. Trans-Canada Airlines' (now Air Canada) first landing was made by a Lockheed Electra Aug. 31, 1938, and TCA began scheduled services to Toronto Oct. 18, 1938.

The declaration of war in September 1939 brought major changes to Malton Airport. Urgently needed aircraft industries were located at, or close to, the airport and training schools were moved to the site under the British Commonwealth Air Training Plan. Passenger services were also extended.

The airport was leased by the federal government from the City of Toronto in January 1940 and the federal government assumed ownership of the site in April 1957.

The 1939 air terminal building was replaced with a one-storey brick building in 1945. This facility had a design capacity of 400,000 passengers per year and was enlarged in 1954 and 1959.

The airport's name was officially changed to Toronto International Airport (Malton) in November 1960, after the introduction of international scheduled service by BOAC in March 1960.

In 1958, a major redevelopment of the airport began, which included construction of a new air terminal building. Although the original plan called for four aeroquays to be built progressively as traffic increased, only one was built. Terminal 1 was officially opened in February 1964.

By March 1967, 10 airlines were using the airport: Air Canada, American Airlines, Canadian Pacific (now Canadian Airlines International), BOAC (now British Airways), Eastern Airlines, Mohawk (now U.S. Air), United Airlines and North Central (renamed Republic Air in 1980).

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Construction of Terminal 2 began in 1969 and it was officially opened in June 1972. The terminal originally handled only charter flights but Air Canada moved its complete operations there in April 1973.

The name of the airport was changed in January 1984 to Toronto - Lester B. Pearson International Airport.

Air traffic during the 1980s continued to grow at Pearson and created the need for an additional air terminal building, Terminal 3, which is scheduled to open in 1990.

During the past 50 years, Pearson has grown from Toronto's second airport to Canada's busiest airport, and one of the 20 busiest airports in the world. In 1988, more than 20 million passengers passed through Pearson.

BACKGROUNDER

GROWTH IN CANADIAN AVIATION INDUSTRY

The past five years have witnessed substantial growth in the total number of both aircraft movements and enplaned/deplaned passengers at Canadian airports.

Specifically, aircraft movements increased nationally by 12.2 per cent during 1984-88 and the total number of passengers increased by 24 per cent during the same time. During that period, total aircraft movements at Pearson International - Canada's busiest airport - increased by 35.4 per cent and the total number of passengers increased by 38.7 per cent.

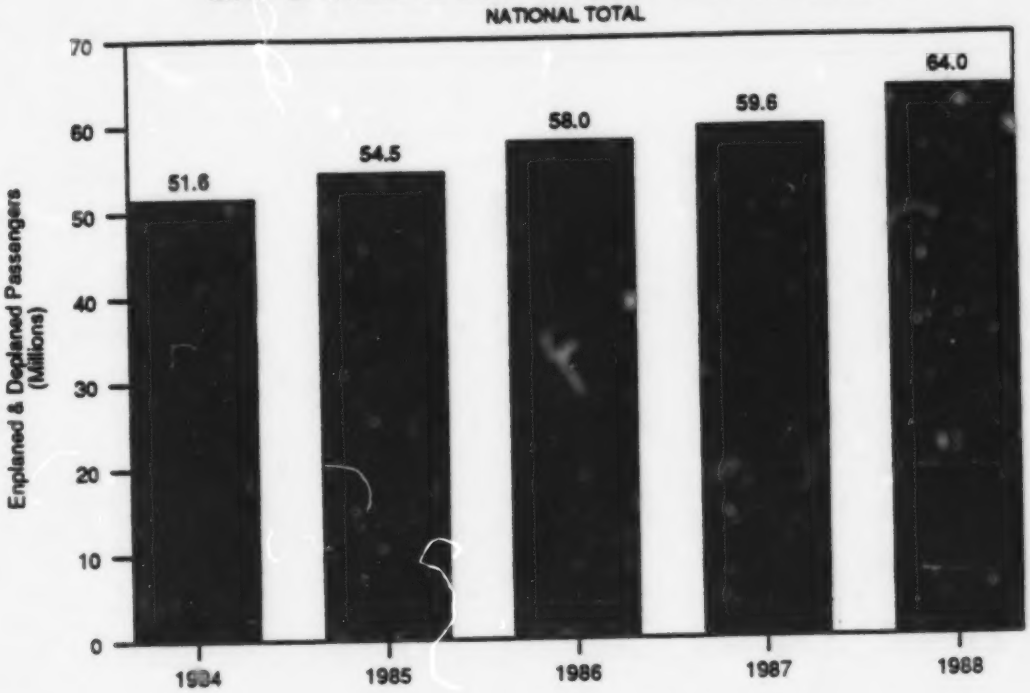
This growth was stimulated by the strength of the Canadian and international economies as well as the impact of economic regulatory reform on the domestic air carrier industry which sparked unprecedented competition among airlines.

Economic regulatory reform allowed Canadian airlines to choose their own service patterns and pricing strategies. In particular, the major Canadian carriers have moved toward the "hub-and-spoke" style of operations. They have identified Toronto as their major hub airport in Central Canada and have sought to concentrate and coordinate flight operations at Toronto.

The world aviation market is forecast to continue growing at more than seven per cent annually during the next decade. The challenge for the Canadian aviation industry is to ensure that Canada is able to negotiate its fair share of this international air industry growth with its attendant benefits, including improved access by Canadian carriers to foreign countries. The Canadian aviation system must be prepared to adapt to and accommodate this future demand for air services in Canada.

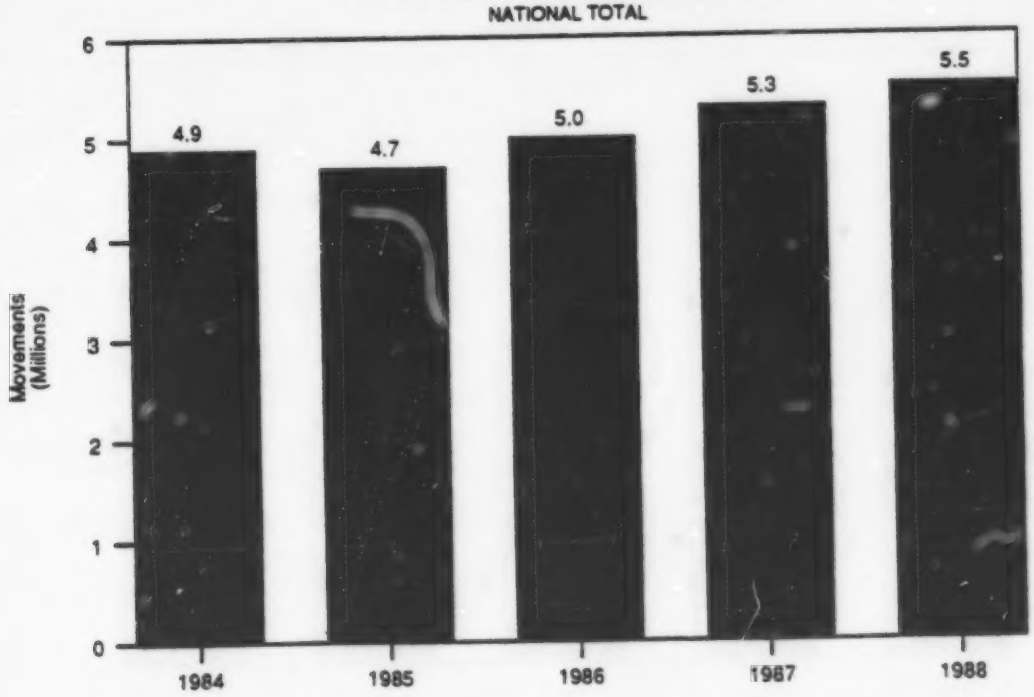
ENPLANED & DEPLANED PASSENGERS

NATIONAL TOTAL



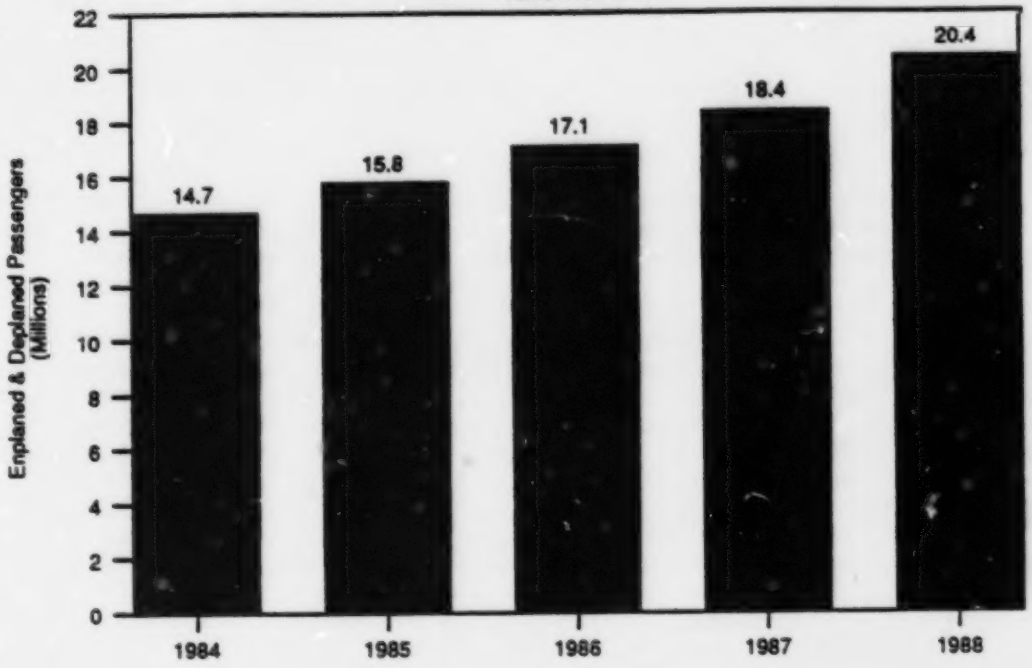
AIRCRAFT MOVEMENTS

NATIONAL TOTAL



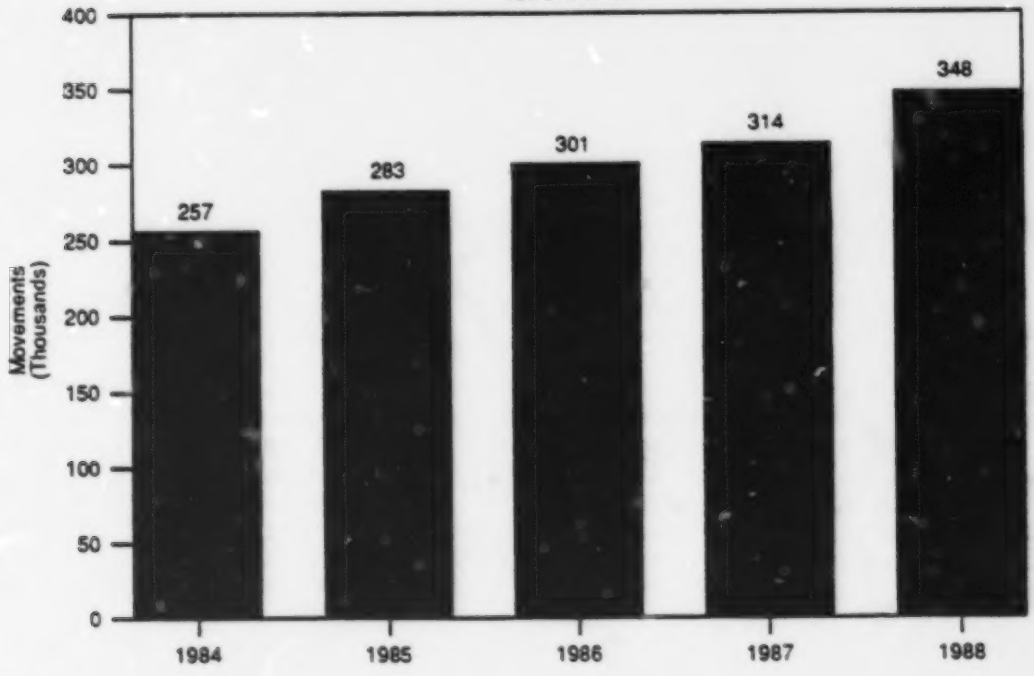
ENPLANED & DEPLANED PASSENGERS

TORONTO - PIA



AIRCRAFT MOVEMENTS

TORONTO - PIA



BACKGROUNDER

TERMINALS ONE AND TWO

Pearson has two main terminals, with a third to open in mid-1990.

Terminal 1

Work began on the familar, circular "Aeroquay" in 1959. Officially opened Feb. 20, 1964, by the late prime minister, Lester B. Pearson, the structure was described as "a showplace in airport design."

Terminal 1's circular concept was designed to minimize passengers' walking distance, maximize speed of service and noise protection and make best use of car parking facilities. The terminal has been modified several times to double its passenger-handling capacity. Renovations last year, done at a total cost of $7,207,000, included enlarging the outbound baggage facilities, improving the arrivals-level baggage room, renovations to the parking garage, adding a new baggage conveyor and building larger passenger holdrooms. The departures area also was substantially enlarged and redecorated.

Following the transfer of some airline traffic from Terminal One to the new Terminal Three in 1990, Terminal 1 will essentially continue in its current form and configuration for several years. The terminal's traffic level will initially decrease to about 3 million passengers a year when a number of improvements will be required to the building's systems and esthetics to carry it through this "interim" period when more substantial renovations may be necessary to enable the facility to fulfil its defined future role.

The required principal improvements include:

1. Restoration of the building's esthetics on the arrivals and departures levels;

2. renovation of washroom facilities;

3. installation of new passenger information and directional signage; and

4. restoration of the building's support system including heating, air conditioning and plumbing.

Airlines currently using Terminal 1 are: Air China, Aerolineas Argentinas, Alitalia, American Airlines, Business Express, BWIA International, Canadian Airlines International, Canadian Partner, Comair, Eastern Airlines, Inter-Canadian, KLM Royal Dutch Airlines, Mall Airways, Northwest Airlines, Olympic Airways, Pem Air, United Airlines, Varig Brazilian and Wardair; charter carriers Nationair and Worldways; and seasonal carriers Lufttransport, Martinair, Sterling Airways and Novair International.

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- Opened in 1964
- Total area: 56,180 square metres
- Original capacity: 3.2 million passengers a year
- Current capacity: 5.5 million passengers a year
- 1988 passengers: 11 million
- Design: circular, 24 boarding gates

Terminal 2

Construction began on the three-stage terminal in September 1969. Terminal 2 is a combination of three linear mini-terminals with all the facilities to process passengers from curbside to the aircraft.

In 1972, the facility was used on a temporary basis to handle all transatlantic charter flights during the June - October peak travel period. When another part of the terminal was opened in April 1973, Air Canada transferred its entire operation to Terminal 2 from Terminal 1. In November 1977, an international wing to Terminal 2 was completed.

A $40-million extension is in progress to give the terminal 50 per cent more capacity for handling international flight arrivals. The three-storey addition to the east end of the terminal includes three additional aircraft gates, passenger check-in counters, public concourse and concession areas, and expanded international arrivals area, with additional baggage claim units.

Planning for the first phase of a complete upgrading of the terminal has started and, subject to Treasury Board approval, work will commence in the fall.

Serving Terminal 2 are: Air Canada, Air France, Air Jamaica, Air Ontario, Air Toronto, British Airways, Cubana, El Al, JAT Yugoslav Airlines, Korean Airlines, LOT Polish Airlines, Lufthansa German Airlines, Pakistan Airlines, Sabina Belgian Airlines, Swissair, TAP Air Portugal, Thai Airways, US Air and Voyageur; charter carriers Air Niagara Express, Air Transat, Canada 3000 (Air 2000), Crownair and First Air (Bradley Air Services), Guyana Airways, Odyssey, Vacationair and Minerve Canada; and seasonal carriers Iberia Airlines and Skyworld (Points of Call).

- Opened in 1972
- Total area: 84,978 square metres
- Original capacity: 6 million passengers a year
- Current capacity: 10 million passengers a year
- 1988 passengers: 9.5 million
- Design: linear, 31 boarding gates

BACKGROUNDER

PEARSON INTERNATIONAL AIRPORT AIR TRAFFIC CONTROL

The success of economic regulatory reform has generated substantial growth in airline traffic at Lester B. Pearson International Airport. Toronto has become the pre-eminent Canadian hub airport, a development that is making unanticipated demands on the existing air traffic control infrastructure and resources. As a result, the system has been taxed, due to a shortage of trained air traffic controllers.

The shortage of air traffic controllers is being addressed on a priority basis and a number of initiatives are under way. The department has hired and will continue to recruit up to 45 experienced air traffic controllers for four-year terms. New candidates are being recruited to be trained at the Transport Canada Training Institute in Cornwall, Ont. The training capacity at the institute will be increased to 300 students from 216 by the end of this year. The maximum number of trainees that can be absorbed by the Toronto air traffic control facility for on-the-job training will be sent to Cornwall. The gains in training capacity are being achieved through course revisions that will streamline the curriculum and eliminate duplication of subject matter covered later in on-the-job training.

In parallel with these measures, a new traffic flow management system is being evaluated at Toronto to permit more accurate prediction of the demand on the Toronto air traffic control facility. This will allow more effective management of controller workload and match demand to available system capacity. Procedural changes are being implemented to improve the efficiency of air traffic movements. Changes in operating techniques, airspace "sectorization" and routings during the next two years will further enhance system integrity, efficiency and effectiveness. An advanced Canadian Automated Air Traffic Control System, planned for the mid-1990s, has already received preliminary approval. This project will place Canada at the leading edge of air traffic control automation and will allow for growth into the 21st century.

The addition of new runways at Pearson will increase airport capacity. This will create minimal increased demands on air traffic controllers. Current initiatives to increase the workforce, together with technological advancements, will keep pace with growth into the next century.

BACKGROUNDER

FLIGHT RESERVATION SYSTEM AND THE CEILING ON FLIGHTS IN AND OUT OF PEARSON INTERNATIONAL AIRPORT

Transport Canada introduced a reservation system in December 1988 to reduce the large number of flight cancellations and delays at Pearson International Airport.

Passengers on scheduled and charter flights into and out of Terminals One and Two have top priority under the new procedures.

The system put a ceiling, or "cap," of 70 flights an hour on the maximum number of flights allowed in and out of the airport.

Although the reservation system and cap were announced as temporary measures to ease heavy congestion at the airport during the Christmas rush, the department decided in mid-January this year to extend them until further notice, subject to periodic review.

Despite significant cuts in flight delays, there has been opposition to the continuation of these measures on a permanent basis. There also has been strong opposition from general aviation companies and business aircraft owners.

Transport Canada officials met several times with these groups in early 1989 to minimize the impact the restrictions were having on their operations.

The "cap" will be maintained at its present level, subject to periodic review, and the reservation system will be streamlined. A prototype automated reservation system will be tested in August and September and, if successful, will be implemented on a full-time basis. In addition, reservations will be made in 30-minute "blocks" instead of hour-long periods to reduce the bunching of flights at the start of each hour.

BACKGROUNDER

RUNWAYS

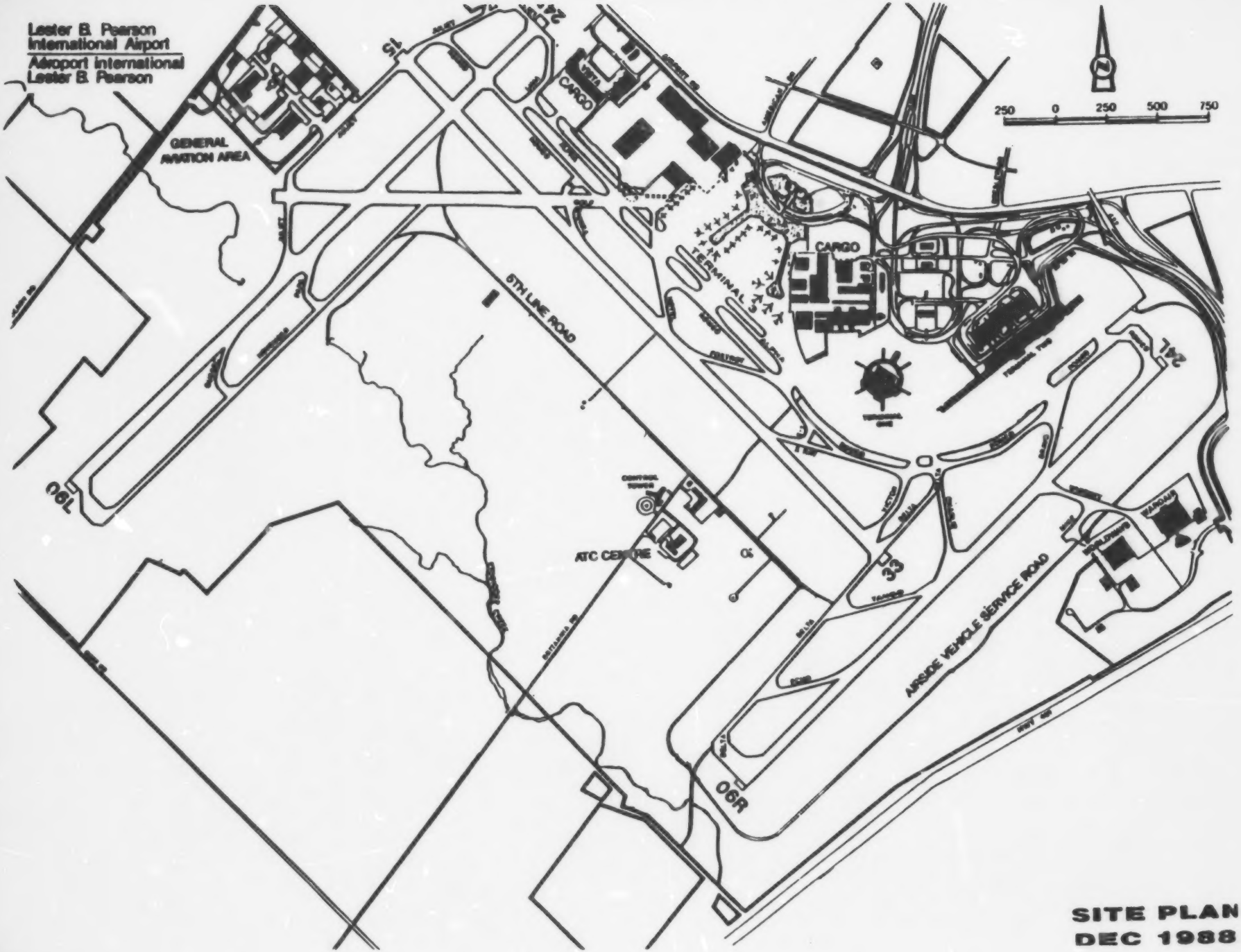
LESTER B. PEARSON INTERNATIONAL AIRPORT

The attached chart shows the existing runway configuration at Pearson International, Toronto.

This runway configuration has a capacity of 82 movements per hour and now is capped at 70 movements per hour. As the chart "Capacity Analysis" indicates, this capacity is below existing demand and the demand is growing. Thus, new runways to accommodate this demand are required.

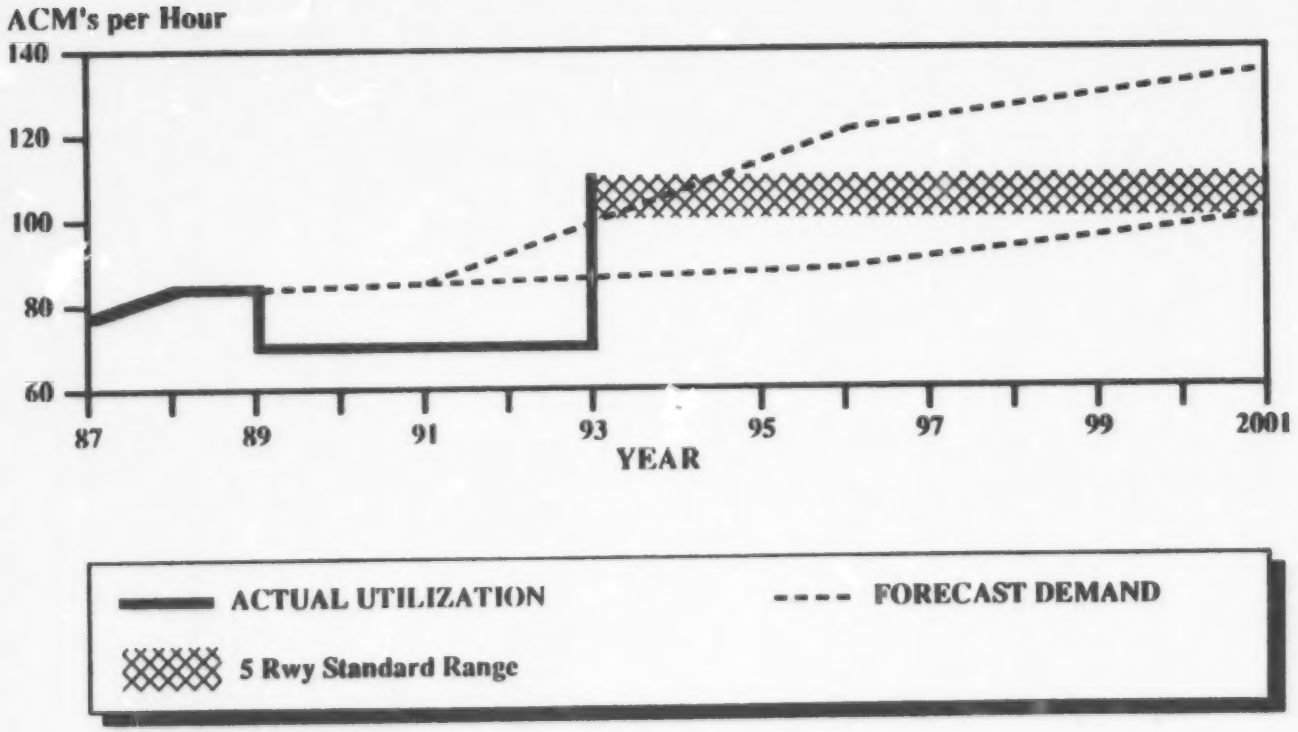
It is likely two runways would be required. One runway would be in an east-west orientation (06-24 direction) which would provide for a major increase in capacity, due to the more prevalent use of the east-west runways because of prevailing winds. The other runway would be in the north-south (15-33) direction and would provide adequate capacity to serve aircraft en route and scheduled into or out of Pearson, when winds or other weather conditions preclude use of the east-west runways.

The prospective location of these new runways is subject to several technical and environmental studies. It is probable the east-west runway would be in the area bordered by the existing parallel runways (06-24), while the north-south runway would be located to the west of existing runway 15-33.



SITE PLAN
DEC 1988

L.B. Pearson Airport
Runway Capacity Analysis



BACKGROUNDER

RADAR MODERNIZATION PROJECT (RAMP) AND THE CANADIAN AUTOMATED AIR TRAFFIC SERVICES (CAATS) PROJECT

To keep aviation in Canada safe and efficient, Canada's air traffic controllers must be provided with state-of-the-art navigation systems that are compatible internationally.

RAMP

RAMP is Transport Canada's 10-year, multi-million-dollar radar modernization project which is intended to replace completely the existing primary and secondary radar and display systems for air traffic control in the 1990s.

The project involves the replacement of air traffic surveillance radars, based on vacuum-tube technology, with solid-state and computer technology to provide more accurate information especially in terms of air traffic and hazardous weather conditions.

Procurement of Transport Canada's new air traffic control systems under the RAMP contracts will improve air travel and produce significant high-quality, long-term industrial benefits in each region of Canada.

CAATS

The overall objective of the CAATS project is to replace Transport Canada's existing air traffic services infrastructure used for flight data-processing and display with a modern, integrated system. The system will enable Transport Canada's Aviation Group to meet future growth-related demands for air traffic services while maintaining our current high level of safety; enable air traffic controllers to operate more efficiently and at increased levels of productivity; and provide significant benefits to users by reducing air traffic delays through the provision of more energy-efficient routes, improved aircraft movement information and flight planning services.

This major project will replace the flight data-processing components of the Canadian air navigation system by December 1996. The project includes procurement, delivery and installation of fully operational flight data-processing systems at the seven area control centres (Gander, Nfld., Moncton, N.B., Montreal, Toronto, Winnipeg, Edmonton and Vancouver) as well as related peripheral equipment for terminal control units at Ottawa and Calgary, 60 airport control towers and one altitude reservation unit.

Two proposals for the CAATS project were received in February 1989. A contract award is expected this year.

CAATS systems are to be commissioned in two phases at the Toronto area control centre, in December 1994, and March 1996. CAATS workstations also will be installed in the control towers at Pearson and Toronto Island Airport in December 1994.

BACKGROUNDER

ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS (EARP)

The 13 steps of an independent panel review are:

Step 1: Initiating department (Transport Canada) officials screen proposal for significant environmental effects and public concern and refer them to the environmental assessment panel.

Step 2: Initiating department's Minister refers the proposal to the federal Environment Minister, identifying the scope and phasing of the proposal, the initiating department's concerns of urgency associated with the proposal and consideration which should be reflected in the environmental assessment panel's terms of reference for a public review of the effects of the proposal.

Step 3: The federal Environment Minister refers the initiating department's request for a panel to the Federal Environmental Assessment and Review Office (FEARO), the central agency responsible for administering the Environmental Assessment and Review Process (EARP). FEARO, in consultation with the initiating department and the Environment Department, select and appoint members of an Environmental Assessment Panel for the proposal.

Step 4: Concurrent with the selection and appointment of the panel members, FEARO in consultation with the initiating department and the Environment Department prepare terms of reference for public review of the proposal and issue same to the panel.

Step 5: Panel initiates proposal to identify public concerns through public meetings and workshops.

Step 6: Panel issues in draft form for public comment (including comments from the initiating department), guidelines for the preparation of an environmental impact statement for the proposal.

Step 7: Panel incorporates public comments and concerns into final guidelines for the environmental impact statement and issues them to the initiating department for action.

Step 8: The initiating department undertakes the required environmental studies and prepares the environmental impact statement (EIS).

Step 9: The initiating department submits the completed environmental impact statement to the panel for initiation of the public review of the proposal.

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Step 10: The panel conducts public hearings to assess the adequacy of the environmental impact statement following an appropriate period for public review of the documents.

Step 11: The panel subsequently prepares a report on its findings to the federal Environment Minister and the initiating department with its recommendations vis-à-vis the outcome of the proposal. At this stage, a variety of courses of action are possible: proceed as described in the proposal; proceed with modifications; or abandon the proposal.

Step 12: The initiating department decides on acceptance of the panel's report in its entirety or in part.

Step 13: The initiating department executes the panel's decision (e.g. proposal proceeds with or without modification).

BACKGROUNDER

NOISE MANAGEMENT PROGRAM

LESTER B. PEARSON INTERNATIONAL AIRPORT

New Management Plan

The new noise management plan will be applicable to all aircraft based on the "noise footprint" of aircraft under normal operating procedures.

A "noise footprint" refers to noise levels generated by aircraft passing overhead. The noise levels are tracked and recorded by electronic sensors.

Consultations are commencing with the airlines to restrict gradually the scheduling of Chapter 2 aircraft by one hour. Operating times will change from 7 a.m. - midnight to 7 a.m. - 11 p.m. by 1991. Late landings resulting from delays caused by weather, mechanical problems or air traffic control, which currently are permitted with airport general manager authorization, will be limited by the summer of 1990.

Operations of Chapter 3 aircraft, such as A-310, -320, D-767, 737-300 and F-100s, can be scheduled between 6 a.m. and 1 a.m. only. Delayed operations, with specific approval, may be authorized for exceptional circumstances, i.e. weather.

Engine run-ups above idle power for all aircraft will be prohibited from midnight to 7 a.m. unless authorized by the airport general manager.

"Chapter 2 and Chapter 3" are aircraft categories set out in an International Civil Aviation Organization Annex (no. 16) that governs aircraft noise levels. Chapter 3 aircraft are the newer, quieter aircraft that major airlines will be using more and more.

Enforcement

An interim radar-tracking and noise-recording system will be installed by the fall 1989 at Pearson to enable the airport's noise management office to radar-track aircraft for violations of noise-abatement procedures.

Another project is under way to acquire state-of-the-art noise-monitoring equipment to enable the management of noise. The new equipment will receive and display radar-track data together with aircraft flight information and noise data. The equipment will be installed by late 1990, in conjunction with the new RAMP radar.

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Each flight operating during the midnight - 7 a.m. period is monitored as to night-flight restrictions approval and preferential runway compliance; all other flights are monitored to ensure adherence to departure procedures.

Non-approved flights are reported to the Transport Canada regional enforcement branch for enforcement action (usually a fine).

The maximum fine will be increased to $10,000.

All convictions will be published.

Repeated violations, defiance or refusals will be subject to suspension of privileges.

BACKGROUNDER

FACILITY REQUIREMENTS TO SERVE INCREASED FLIGHTS

HAMILTON AIRPORT

Hamilton Airport is currently limited in its ability to accommodate passenger traffic. The constraints on the site include:

1. The air terminal building which can accommodate, at a reasonable level of comfort, individual aircraft with a load of fewer than 150 passengers at a throughput rate of 200 passengers per hour;

2. apron capacity which can accommodate up to seven B737-200-type aircraft. Larger aircraft cannot be accommodated without jeopardizing compliance with Transport Canada safety standards; and

3. capacity constraints on the airport road system and parking lots which are designed to accommodate passenger flows of up to 200 per hour.

Funds will be provided to upgrade the facilities at Hamilton as demand warrants. It is forecast the first stage of the program could cost approximately $2 million and take 9 - 12 months to complete. This work would increase peak-hour passenger capacity at Hamilton to 350 from 200 enplaning and deplaning passengers when required by increased demand and could include:

- Internal remodelling in the terminal to improve passenger flows;
- expansion of ticket counters;
- installation of a temporary building to process enplaning passengers;
- expansion to the apron and widening taxiways to accommodate DC10-30-type aircraft; and
- upgrading of the power supply.

If warranted by increased use at Hamilton, the building could be further expanded, at a cost of approximately $19.5 million, and would take up to 30 months to construct. This expansion would increase passenger capacity from 350 to 650 enplaned/deplaned passengers and could include:

- Major expansion of the terminal building to accommodate arriving passengers;
- renovation of existing terminal to accommodate departing passengers;
- enlarging and strengthening the apron to accommodate up to nine wide- and narrow-bodied aircraft at the same time;
- re-aligning the terminal entrance road to accommodate increased traffic;
- increasing car parking from 450 to 900 spaces; and
- expanding other facilities such as municipal utilities, storm water drainage system, and power supply to accommodate the expanded facilities.

BACKGROUNDER

TECHNICAL STUDIES RE LESTER B. PEARSON
INTERNATIONAL AIRPORT AND SOUTHERN ONTARIO

The work to be undertaken at Lester B. Pearson in the next several months includes technical studies for both the new runways as well as the master plan. In this regard, consultants will be retained, starting this week, to undertake the following studies on the airside improvement project:

- Soil analysis;
- noise studies and projections;
- drainage;
- socio-economic review;
- runway location options;
- aeronautical zoning requirements;
- funding and delivery options for the runways;
- airspace configuration requirements;
- electronic navigational aids requirements; and
- demand forecasting and preparation of nominal schedules.

As well, when the Environmental Assessment and Review Panel (EARP) has prepared its guidelines for the preparation of an Environmental Impact Statement, Transport Canada will engage the required expertise to prepare this document.

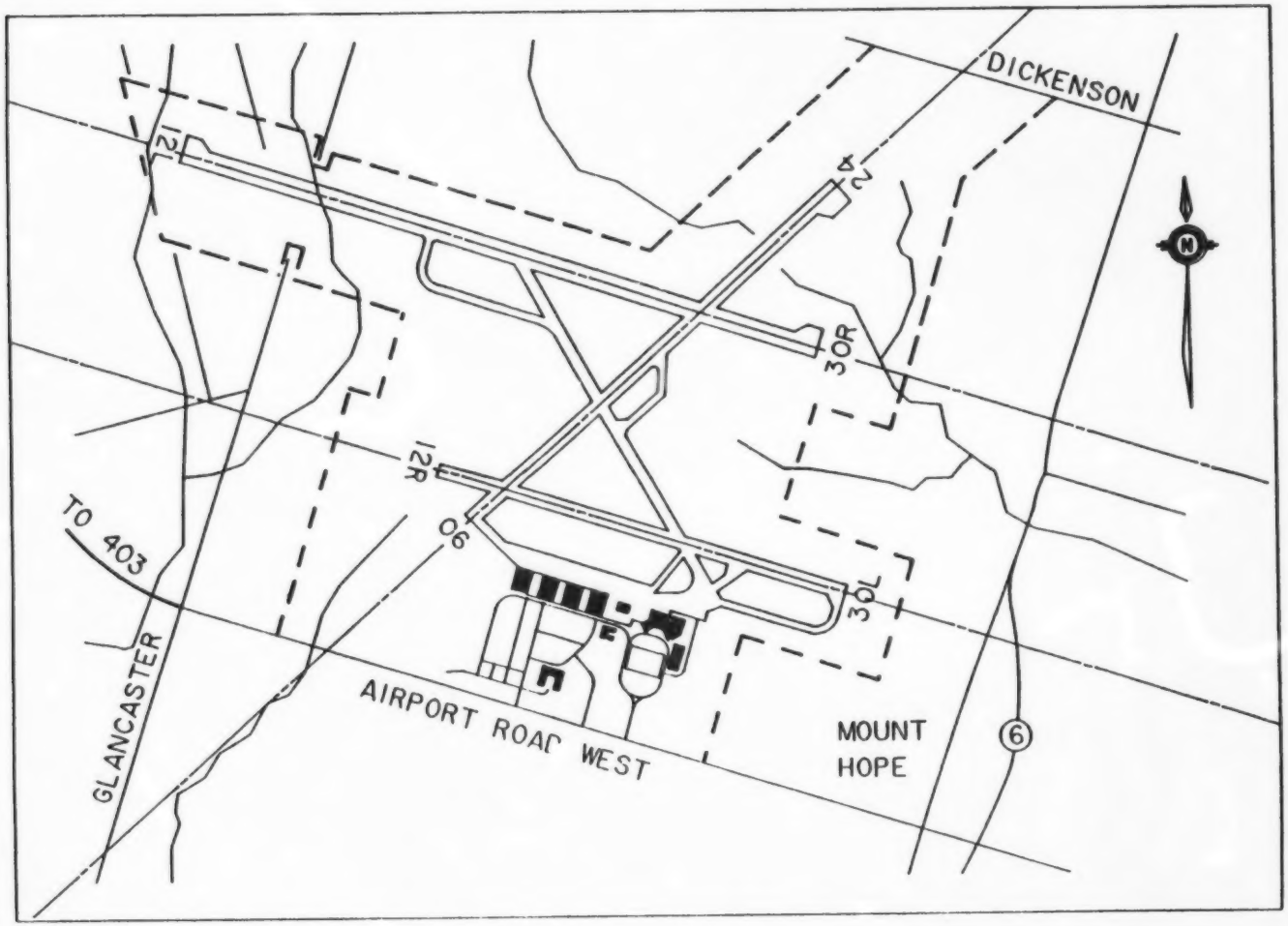
Transport Canada will also commence contracting consultants to prepare the studies required for the Pearson International Airport Master Plan. To be studied are:

- Various land use options of the site;
- forecasts of passenger and aircraft movements;
- socio-economic impact studies;
- aeronautical zoning changes and requirements; and
- environmental studies as required by the EARP.

Transport Canada also will contract consultants to begin studies required to produce the Southern Ontario Area Systems Plan. These consultants will be involved in several diverse studies, including:

- Inventories of existing facilities and their capabilities;
- land use options;
- airspace configuration;
- equipment needs;
- socio-economic analysis; and
- option analysis (by site and between sites).

While the above lists are not exhaustive, they do indicate the magnitude of the Transport Canada program to ensure that a socially, environmentally and economically balanced system is planned and implemented in Southern Ontario.



HAMILTON AIRPORT

ANNEX 7

Airports Within 80 Km of Downtown Toronto

Airport	Operator	No. of Runways	Longest Runway Length (feet)	1987 Aircraft Movements
Open Use				
Brampton	PRI	2	2500	N/A
Burlington Airpark	PRI	2	2800	N/A
Buttonville	PRI	2	3750	161,100
Greenbank	PRI	2	2200	N/A
Guelph	PRI	2	2500	N/A
Hamilton Civic	MUN	3	8000	135,600
LBPIA	TC	4	11050	314,400
Markham	PRI	1	2045	N/A
Oshawa	MUN	3	3476	92,300
Shelburne/Burbank Field	PRI	1	2000	N/A
Toronto Island	MUN	3	4000	198,100
York	PRI	2	1500	N/A
Permission Required Prior to Use				
Alliston	PRI	1	2300	N/A
Alliston (R. Reid)	PRI	1	1800	N/A
Alliston (W. Gibson)	PRI	1	1750	N/A
Beeton (K. Norris)	PRI	1	2200	N/A
Bond Head (E. Wilcox)	PRI	1	1800	N/A
Borden	DND	2	3510	N/A
Bowmanville (L. Haunsberger)	PRI	1	1800	N/A
Caledon (P. Irwin)	PRI	1	3200	N/A
Cambridge/Reid's Field	PRI	1	3000	N/A
Cookstown	PRI	1	2500	N/A
Downsview	PRI	2	7000	N/A
Erin (G. Harris)	PRI	1	1600	N/A
Erin	PRI	1	2500	N/A

Permission Required Prior to Use (cont'd)

Fergus (A. Kamph)	PRI	1	2100	N/A
Grand Valley	PRI	1	1800	N/A
Grand Valley (B. Brennan)	PRI	1	2300	N/A
Guelph (H. Branston)	PRI	2	2200	N/A
Guelph (T. Smith)	PRI	1	1700	N/A
Inglewood (B. Pallett)	PRI	1	2000	N/A
Laurel/Murray Wesley Kot Aerodrome	PRI	1	1800	N/A
Lefroy	PRI	1	1700	N/A
Mansfield	PRI	2	1900	N/A
Maple (I. Reaman)	PRI	2	1800	N/A
Mono Mills (R. Lank)	PRI	1	1800	N/A
Nobleton	PRI	1	2400	N/A
Oak Ridges (M. Sifton)	PRI	1	2500	N/A
Orangeville	PRI	1	2200	N/A
Orangeville (D. Douglas)	PRI	1	2000	N/A
Orangeville (H. Hughes)	PRI	1	2200	N/A
Orono (W. Hawke)	PRI	1	2000	N/A
Orton (D. Cannon)	PRI	1	1700	N/A
Palgrave (W. Munnings)	PRI	3	2450	N/A
Port Perry (A. Kerry)	PRI	1	1900	N/A
Pottageville	PRI	1	1585	N/A
Rockton	PRI	1	2500	N/A
Sharon (E. Goodwin)	PRI	1	2000	N/A
Shelburne (D. Barr)	PRI	1	1600	N/A
Stoney Creek	PRI	2	2850	N/A
Sutton (G. Knupp)	PRI	1	2800	N/A
Tottenham (G. Volk)	PRI	2	3500	N/A